United States
Department of
Agriculture

Economic
Research
Service

DS-396

March 1984

Dairy

OUTLOOK & SITUATION

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Approved by the World Agricultural Outlook Board. Summary released Wednesday, March 21, 1984. The next summary of the **Dairy Outlook and Situation** is scheduled for release on Wednesday, June 20, 1984. It will appear on several computer information networks by 3:30 ET the same day. Full text and tables are also released electronically, often several days before the report itself is published. For information on providers of electronic access to Outlook and Situation reports, write EMS/USDA, Room. 440 GHI Bldg, Washington, D.C. 20250. Telephone (202) 382-9759.

The present forecasts will be updated if needed in the World Agricultural Supply and Demand Estimates scheduled for release on April 10 and 24, May 10, and June 12, 1984.

The **Dairy Outlook and Situation** is published quarterly. Annual subscription: $8 U.S., $10 foreign. Order from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Make checks payable to the Superintendent of Documents.

Current subscribers will receive renewal notices from the Government Printing Office approximately 90 days before their subscription expires. Notices will be sent ONLY ONCE and should be returned promptly to ensure uninterrupted service.

Summary

Total milk production during calendar 1984 is expected to decline 3 to 5 percent from the record 140 billion pounds produced last year. The lower output will result primarily from reduced marketings by participants in the dairy diversion program. Increased feed costs and lower milk prices are also having an impact.

Nearly 38,000 dairy farmers signed contracts with USDA to reduce milk marketings. They signed up for a total milk diversion of 7.5 billion pounds during calendar 1984, 22.9 percent of their base. In 1983, the participants milked about 19 percent of all U.S. dairy cows and marketed about 22 percent of the milk sold. They represent 12 percent of all operations with milk cows and about 20 percent of all commercial dairy farms. Because some participants were eligible for program payments for cuts made by the end of 1983, actual diversions in 1984 are estimated at about 5 billion pounds.

Milk production in 1983 was 3.1 percent larger than a year earlier, the result of 2.3 percent more output per cow and 0.8 percent more cows. However, during January-February1984—the first 2 months of the diversion period—milk production was 0.9 percent above a year earlier; 0.1 percent in January and 1.8 percent in February. After adjusting for leap year, however, February production was down 1.8 percent. The dairy cow herd declined by 106,000 head from November 1983 to January 1984 and by another 106,000 from January to February. Output per cow in February, after adjustment, was about 1 percent lower than the previous year.

Cow numbers are expected to decline further in 1984, resulting in a yearly average that is 3 to 4 percent below 1983. Much of the drop will come from increased culling by program participants, but some nonparticipants also will reduce their herds because of lower effective receipts per cwt and higher costs. Output per cow is expected to be unchanged to down 1 percent because some participants are reducing marketings through lower milk per cow.

Prices received by U.S. farmers for all milk during January-February averaged $13.55 per cwt, 25 cents below a year earlier. Milk prices are expected to strengthen by yearend, but probably will average 10 to 30 cents per cwt below 1983's $13.56. The effective all-milk price (adjusted for differences in deductions) may be down 20 to 40 cents.

Wholesale prices for butter, cheddar cheese, and nonfat dry milk are down from a year ago, reflecting surplus supplies and lower CCC purchase prices. They are expected to remain near current levels and below a year earlier until late summer.

Commercial disappearance of all milk and dairy products (milk-equivalent, fat-solids basis) was weak during most of 1983. However, a 3-percent gain during October-December raised total disappearance for 1983 about 0.3 percent above a year earlier. Gains in 1984 are not likely to be as strong as fourth-quarter 1983, but use may be up 1 to 3 percent. The expected increase is the result of a lower support price for milk that will help hold down retail dairy product prices, the improving economy, and the national dairy product promotion program that will become effective later this year.

USDA net removals under the milk price support program totaled 16.8 billion pounds (milk-equivalent, fat-solids basis) last year, up 17.7 percent from 1982. With lower milk production (marketings) and higher commercial disappearance, removals are expected to decline substantially in 1984. However, even with the lower purchases, USDA uncommitted inventories of dairy products would remain very large.

Table 1.—U.S. dairy situation at a glance

Item	Unit or base period	Quarterly data					
		4th 1981	4th 1982	1th 1983	2nd 1983	3rd 1983	4th 1983
Production and cow numbers:							
Total milk	Mil. lb	32,060	32,869	34,247	36,881	35,015	33,825
Milk per cow	Lb	2,917	2,971	3,091	3,321	3,145	3,031
Number of milk cows	Thou.	10,991	11,064	11,079	11,106	11,135	11,158
Prices received by farmers:							
All milk, sold to plants, 100 pounds	Dol	14.00	13.87	13.73	13.33	13.33	13.83
Percentage of parity[1]	Pct	67	63	62	63	61	60
Manufacturing grade milk, 100 pounds	Dol	12.97	12.97	12.80	12.53	12.33	12.80
Parity equivalent	Dol	17.89	18.86	19.78	20.02	20.11	20.26
Fat content	Pct	3.81	3.82	3.75	3.62	3.52	3.81
Minnesota-Wisconsin (3.5% fat), 100 pounds	Dol	12.53	12.58	12.58	12.51	12.49	12.40
Milk eligible for fluid market, 100 pounds	Dol	14.20	14.03	13.93	13.47	13.47	13.97
Price ratio and dairy ration value:							
Milk/16-percent feed price relationship	Lb	1.54	1.61	1.56	1.45	1.41	1.37
Value of concentrate ration fed, milk cows	Dol	7.74	7.30	7.28	7.46	7.81	8.30
Farm cash receipts from dairy products	Mil. dol	4,443	4,538	4,632	4,828	4,621	4,493
Production of factory products:							
Butter	Mil. lb	302.3	300.0	380.7	357.1	262.9	305.6
American cheese, whole milk	Mil. lb	619.3	655.7	705.2	819.3	703.3	688.7
Cheese other than American	Mil. lb	430.9	485.8	439.1	454.1	453.2	510.7
Canned milk, unskimmed	Mil. lb	193.6	181.6	163.6	183.3	154.5	159.3
Dry whole milk	Mil. lb	26.3	24.3	26.6	26.9	26.0	29.6
Frozen products[2]	Mil. gal	244.6	247.5	263.2	348.4	369.6	253.8
Creamed cottage cheese	Mil. lb	176.3	172.1	184.9	192.7	196.6	172.1
Total (milk-equivalent, fat-solids basis)[3]	Mil. lb	17,725	18,445	20,569	22,753	20,296	18,883
Nonfat dry milk, human use	Mil. lb	291.4	296.9	368.4	451.8	377.8	314.7
Wholesale prices:							
Butter, Grade A, Chicago, pound	Ct	149.2	147.9	147.2	147.3	148.7	146.0
Cheese, American (40-pound blocks), f.o.b. Wisconsin assembling points, pound	Ct	140.6	140.4	138.6	137.5	137.7	139.4
Evaporated milk, case	Dol	21.90	22.02	22.16	22.23	22.23	22.23
Nonfat dry milk, pound, f.o.b. Central States, high heat	Ct	93.4	93.2	93.4	93.4	93.4	92.6
Dairy products (BLS)	1967=100	247.2	250.3	250.8	250.8	250.5	250.5
Retail prices (BLS):							
Consumer price index[4]	1967=100	280.7	293.4	293.2	296.9	300.5	303.1
All food[4]	1967=100	277.5	286.6	289.2	292.1	292.3	293.1
All dairy products[4]	1967=100	245.0	247.4	249.6	250.1	250.1	250.1
Fluid milk and cream	12/77=100	134.9	135.2	136.7	136.5	136.3	135.9
Whole milk	1967=100	220.7	221.2	223.5	223.2	222.9	222.1
Other	12/77=100	135.1	135.3	137.3	136.8	136.5	136.4
Manufactured dairy products	12/77=100	143.6	146.5	147.2	148.3	148.5	149.1
Butter	1967=100	248.0	252.4	253.5	253.7	253.8	255.0
Cheese	12/77=100	141.0	144.6	145.4	146.3	146.7	146.6
Frozen desserts	12/77=100	149.8	151.5	152.1	153.2	152.8	154.7
Other	12/77=100	138.5	141.2	142.4	144.1	145.5	145.6
Margarine	1967=100	255.8	257.5	257.0	258.7	258.7	269.1
Stocks, end of quarter:							
Creamery butter	Mil. lb	429.2	466.8	533.0	588.5	555.3	499.4
Cheese total[5]	Mil. lb	975.8	1,064.2	1,145.7	1,194.7	1,323.0	1,268.1
Canned milk, unskimmed	Mil. lb	46.8	52.9	49.1	76.7	94.9	47.7
Dry whole milk	Mil. lb	6.0	6.0	5.0	5.8	4.4	6.4
Total (milk-equivalent, fat-solids basis)[6]	Mil. lb	18,377	20,054	22,204	23,847	24,418	22,658
Nonfat dry milk	Mil. lb	889.7	1,282.0	1,305.7	1,401.4	1,419.1	1,394.9
Commercial disappearance:							
Creamery butter	Mil. lb	243.2	251.0	208.3	208.5	219.0	253.0
Cheese, American	Mil. lb	556.5	528.1	459.2	558.4	473.3	581.2
Cheese, other than American	Mil. lb	532.9	596.2	496.2	496.5	498.3	607.0
Canned milk, unskimmed	Mil. lb	246.0	230.0	163.3	153.0	131.9	204.1
Milk in all products	Mil. lb	30,562	31,057	28,205	30,955	31,604	32,003
Nonfat dry milk	Mil. lb	118.0	120.2	109.0	111.2	129.4	93.1
USDA net removals:							
Butter	Mil. lb	44.4	44.6	172.5	148.9	44.3	47.5
Cheddar cheese	Mil. lb	73.2	117.1	209.7	272.2	221.4	129.5
Nonfat dry milk	Mil. lb	174.6	173.9	271.6	331.4	270.3	187.7
Evaporated milk	Mil. lb	4.0	5.3	5.3	5.0	6.8	7.5
Total (milk-equivalent, fat-solids basis)	Mil. lb	1,649	2,089	5,645	5,776	3,117	2,275

[1]Seasonally adjusted prices as percentage of parity price. [2]Ice cream, ice milk, and sherbet. [3]Includes manufactured products for which current data are available. [4]For all urban consumers starting January 1978. [5]Natural plus processed American cheese held by CCC. [6]Excludes cream and bulk condensed milk.

PRODUCTION

Diversion Participation Low

Nearly 38,000 dairy farmers signed contracts with USDA to reduce milk marketings this year. During calendar 1983, the participants milked about 19 percent of the total dairy cow inventory and marketed about 22 percent of the total milk sold by producers. They represent 12 percent of all operations with milk cows, and about 20 percent of all commercial dairy farms. Their average herd size was about 57 cows.

On an annual basis, the participants enrolled base marketings of 32.8 billion pounds. They contracted to divert 7.5 billion pounds during calendar 1984, 22.9 percent of their base. The contracted reductions total 5.4 percent of 1983 production (5.5 percent of 1983 marketings).

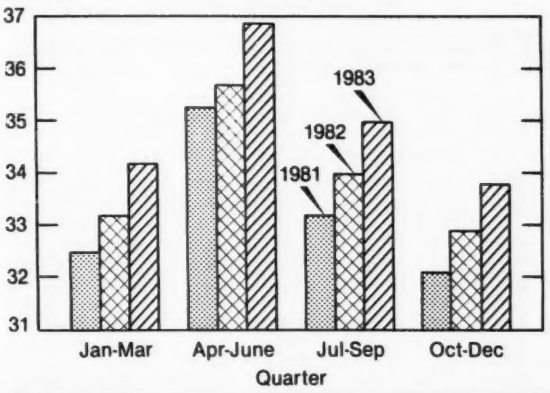
Some producers were eligible for program payments for reductions they had already made by the end of 1983. Using the reported marketings of participants during the third quarter as a guide, about a third of contract diversions fall into this category. Therefore, participants' actual diversions in 1984 are estimated at about 5 billion pounds. For additional information on the signup, see the special article in this issue.

Expansion Ended

Milk production for the first 2 months of 1984 was up 0.9 percent from a year earlier. January was up 0.1 percent and February was up 1.8 percent. February marked the 58th consecutive month of year-over-year increases. However, if adjusted for the extra day, production in February was down 1.8 percent. Output per cow rose 2.7 percent, but was down 0.8 percent after adjusting for leap year, while cow numbers were down 1 percent. Milk production for the rest of 1984 is expected to be below a year earlier because of the diversion program, increased feed costs, and lower effective receipts per cwt.

Of 33 States surveyed, 15 increased production in February, 16 showed declines, and 2 equaled 1983. After adjusting for leap year, only five States posted increased production. Of the five major dairy States, production after adjustment was down 2.7 percent in Wisconsin—the leading producer, and 4.5 percent in Minnesota. In California—the number two producer—output rose 0.7 percent, while New York's production was up 1.8 percent, and Pennsylvania's was up 1.6 percent from a year earlier. Sharpest declines occurred in the Kentucky-Tennessee area and the Southeast region.

U.S. Milk Production by Quarters, 1981 to 1983



USDA Neg. ERS 5498-84(3)

1983 Production Review

Milk production during calendar 1983 was nearly 140 billion pounds, up 4.2 billion (3.1 percent) from the 1982 record. The gain stemmed from more cows and larger yields per cow than a year earlier. Each month of 1983 posted a year-over-year expansion in production, with June and July leading the way with gains of 3.7 percent each.

Milk output per cow increased by 2.3 percent in 1983, slightly more than two times the annual rate of gain for 1982, but approximately equal to the most recent 10-year average of 2.4 percent. In general, the year-to-year gains in yields slowed throughout 1983. First-quarter yields were up 2.5 percent, while the fourth quarter posted a 2-percent increase. The moderation of the gains likely resulted from lower effective receipts for milk marketed after April 15, 1983 (the first 50-cent deduction started April 16), higher feed costs in second-half 1983, and the refundable second 50-cent deduction during September-November 1983.

The average number of milk cows on farms during 1983 was up 0.8 percent from 1982. When combined with gains of 0.6 percent in 1980 and 1 percent in both 1981 and 1982, last year was the fourth year of an expansion in cow numbers, the longest expansion in the Nation's dairy herd since 1941-44. The average number of milk cows on farms was 0.4 percent larger than a year earlier in January 1983, but 1 percent larger in September. The Nation's dairy herd increased in size and at a faster pace in 1983 than a year earlier because of a large number of replacement heifers, the relatively low cull cow price, and the unknown direction of the dairy price support program.

All five of the major milk-producing States increased production last year. Minnesota and New York led with gains of about 5.5 percent, followed by Pennsylvania and Wisconsin with gains of about 2.5 percent, and California with an increase of 1.6 percent. Of all States, New Mexico had the largest increase last year—a jump of more than 15 percent. On a year-to-year basis, production declined in only seven States and equaled a year earlier in two.

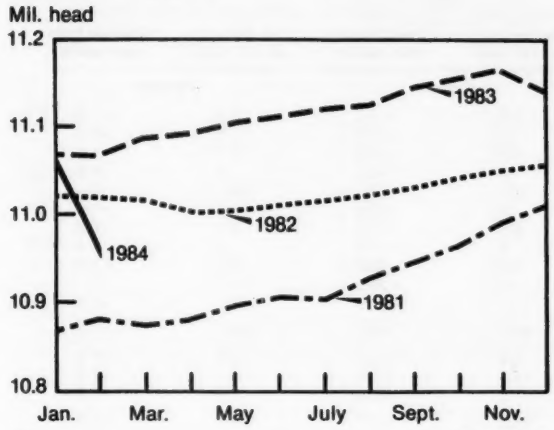
Milk production increases occurred in 9 of the 10 farm production regions during 1983. The one region experiencing a decline, the Delta States, was down 0.3 percent because of a drop in cow numbers. The Southern Plains had the largest increase, up 4.4 percent because of 3.5 percent larger output per cow and 0.9 percent more cows. Production gains in the four primary regions were led by a 3.6-percent expansion in the Lake States, followed by 3.5 percent in the Northeast and about 3 percent in the Corn Belt and the Pacific.

Table 2.—Milk production, milk per cow, and milk cows on farms, by months, 1981-84, with comparisons

Item	1981	1982	1983	1984[1]	Change from year earlier			
					1981	1982	1983	1984
	Million pounds				*Percent*			
Milk production[2]								
January	10,805	11,121	11,473	11,490	+4.7	+2.9	+3.2	+0.1
February	10,161	10,394	10,725	10,905	+1.9	+2.3	+3.2	+1.7
March	11,549	11,731	12,049		+5.5	+1.6	+2.7	
April	11,555	[3]11,654	11,966		+4.8	+0.9	+2.7	
May	12,099	[3]12,241	12,642		+3.4	+1.2	+3.3	
June	11,606	[3]11,830	12,273		+2.4	+1.9	+3.7	
July	11,387	[3]11,633	12,061		+2.8	+2.2	+3.7	
August	11,132	[3]11,375	11,692		+3.1	+2.2	+2.8	
September	10,659	[3]10,954	11,262		+3.0	+2.8	+2.8	
October	10,768	[3]11,066	11,430		+2.9	+2.8	+3.3	
November	10,387	[3]10,656	11,000		+3.3	+2.6	+3.2	
December	10,905	[3]11,147	11,395		+3.9	+2.2	+2.2	
Total[4]	133,013	135,802	139,968		+3.5	+2.1	+3.1	
	Pounds				*Percent*			
Milk per cow[2]								
January	994	1,008	1,036	1,039	+3.8	+1.4	+2.8	+0.3
February	934	943	969	995	+0.9	+1.0	+2.8	+2.7
March	1,062	1,065	1,086		+4.5	+0.3	+2.0	
April	1,061	[3]1,059	1,079		+3.7	−0.2	+1.9	
May	1,110	[3]1,112	1,138		+2.4	+0.2	+2.3	
June	1,064	[3]1,074	1,104		+1.3	+0.9	+2.8	
July	1,044	[3]1,055	1,084		+1.9	+1.1	+2.7	
August	1,018	[3]1,031	1,051		+2.1	+1.3	+1.9	
September	974	[3]992	1,010		+2.0	+1.8	+1.8	
October	982	[3]1,001	1,024		+1.9	+1.9	+2.3	
November	945	[3] 963	985		+2.1	+1.9	+2.3	
December	990	[3]1,007	1,022		+2.5	+1.7	+1.5	
Total[4]	12,177	12,309	12,587		+2.4	+1.1	+2.3	
	Thousands				*Percent*			
Milk cows on farms[5]								
January	10,871	11,029	11,075	11,064	+0.9	+1.5	+0.4	−0.1
February	10,881	11,024	11,072	10,958	+1.0	+1.3	+0.4	−1.0
March	10,879	11,020	11,090		+1.0	+1.3	+0.6	
April	10,886	[3]11,005	11,094		+1.0	+1.1	+0.8	
May	10,898	[3]11,008	11,107		+1.0	+1.0	+0.9	
June	10,906	[3]11,015	11,116		+1.0	+1.0	+0.9	
July	10,904	[3]11,026	11,126		+0.9	+1.1	+0.9	
August	10,930	[3]11,031	11,129		+0.9	+0.9	+0.9	
September	10,949	[3]11,040	11,150		+1.0	+0.8	+1.0	
October	10,969	[3]11,055	11,159		+1.1	+0.8	+0.9	
November	10,993	[3]11,066	11,170		+1.2	+0.7	+0.9	
December	11,011	[3]11,071	11,146		+1.4	+0.5	+0.7	
Annual average	10,923	11,033	11,120		+1.0	+1.0	+0.8	

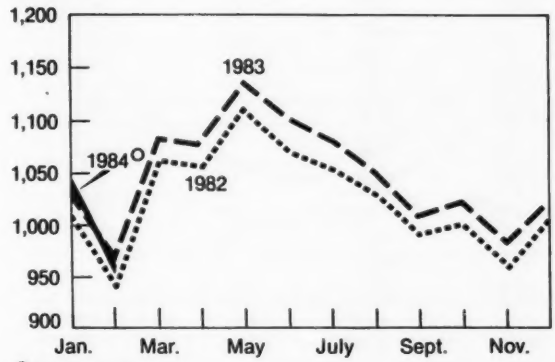
[1]Preliminary. [2]Excludes milk sucked by calves. [3]ERS derived data consistent with published official USDA quarterly estimates. No monthly data for an individual State or region are available. [4]May not add because of rounding. [5]Excludes heifers not yet fresh.

Milk Cows on Farms



USDA Neg. ERS 262-84(3)

Milk Production Per Cow



OAdjusted for Leap Year.

USDA Neg. ERS 261-84(3)

Table 3.—Milk cow numbers, milk per cow, and changes by production regions, 1983

Production regions	Milk cow numbers[1]	Milk per cow	Change from year earlier: Milk cow numbers[1]	Milk per cow	Milk production
	1,000 hd	*Pounds*		*Percent*	
Northeast	2,226	12,708	+1.2	+2.3	+3.5
Lake States	3,148	12,783	+0.5	+3.2	+3.6
Corn Belt	1,473	11,724	+1.1	+2.0	+3.1
Northern Plains	513	11,097	+1.4	+2.5	+3.9
Appalachian	799	11,045	+0.4	+0.1	+0.5
Southeast	421	11,052	−1.4	+1.1	−0.3
Delta States	279	9,717	−1.4	+1.7	+0.3
Southern Plains	444	11,628	+0.9	+3.5	+4.4
Mountain	538	13,680	+1.5	+2.1	+3.6
Pacific[2]	1,268	15,460	+1.4	+1.5	+2.9
United States[2]	[3]11,120	[3]12,587	+0.8	+2.3	+3.1

[1]Average number during the year. [2]Includes Alaska and Hawaii. [3]May not add to totals because of rounding.

Fewer Dairy Farms; Larger Herds

The number of operations with milk cows declined to 303,710 in 1983, down 2.7 percent from 312,100 in 1982. Only Arizona posted an increase. Of the five leading milk-producing States, only Minnesota reported a decline in operations while each of the other four—Wisconsin, California, New York, and Pennsylvania—reported no change. Meanwhile, with more milk cows in the Nation's dairy herd last year, the average number of cows per operation rose to 36.6, nearly 1.3 cows larger than a year earlier.

January Milk Cow Inventory Larger

Milk cows on farms on January 1, 1984, numbered 11.14 million head, an increase of 20,000 from July 1, 1983, and 64,000 (0.6 percent) more than a year earlier. Dairy heifers (500 pounds and over) held for herd replacements were 4.54 million, an increase of 8,000 (0.2 percent) from January 1, 1983. With a gain in both cows and heifers, the number of heifers per 100 milk cows averaged 40.8, about unchanged from a year earlier and still a relatively large number. Five years earlier the number of heifers per 100 milk cows was 36.4.

A near-record rate of culling during 1983 partly offset the large number of replacements, hence the addition of only 64,000 cows during 1983. Based on the January inventories in 1983 and 1984 and assuming that 70 percent of the January 1983 replacements calved during the year, 28.1 percent of the cow herd was culled last year. This rate was down slightly from the 1982 record of 28.2 percent and stands in sharp contrast with the annual average culling rate of 25.3 percent during the 1970's. Dairy cow slaughter totaled about 3.1 million head in 1983, unchanged from 1982, but nearly 220,000 more than 1981.

Feed Supply and Price Situation

The milk/feed price relationship during January slipped to 1.34 from 1.36 during November and held steady in February, the lowest level since June 1977. The decline resulted from a lower all-milk price that reflected the lower support price since December 1, 1983. The ratio is expected to decline slightly on a month-to-month basis through late spring because of possible higher feed prices and seasonally lower milk prices. Then the relationship is likely to improve substantially, moving above year-earlier levels late this summer and staying higher into early 1985 because of lower feed and higher milk prices.

January 1, 1984, corn stocks, at 4.9 billion bushels, imply a tight supply-demand situation for feed grains until harvest. The cash price for corn during January-February was below fourth-quarter 1983 harvest levels, consequently the use of corn may have continued at a high rate this winter. With tight supplies, corn prices are expected to move higher this spring.

An additional price factor for corn in 1984 and 1985 is the size of the crop this fall. February planting intentions were for about 82 million acres. With normal yields, the crop could be around 8 billion bushels. That would provide an adequate supply and corn prices likely would fall below year-earlier levels this fall.

Table 4.—Milk: Production by States and regions, 1981-1983 with comparisons

State and region	1981	1982	1983[1]	1982		1983	
				As percent of U.S. total	Change from year earlier	As percent of U.S. total	Change from year earlier
	Million pounds			*Percent*		*Percent*	
Maine	698	727	741	0.5	+4.2	0.5	+1.9
New Hampshire	346	365	381	.3	+5.5	.3	+4.4
Vermont	2,298	2,385	2,412	1.8	+3.8	1.7	+1.1
Massachusetts	578	602	611	.4	+4.2	.4	+1.5
Rhode Island	46	46	46	(2)	0	(2)	0
Connecticut	624	644	654	.5	+3.2	.5	+1.6
New York	11,069	11,097	11,691	8.2	+.3	8.4	+5.4
New Jersey	494	492	500	.4	−.4	.4	+1.6
Pennsylvania	8,965	9,264	9,510	6.8	+3.3	6.8	+2.7
Delaware	124	137	137	.1	+10.5	.1	0
Maryland	1,556	1,581	1,605	1.2	+1.6	1.1	+1.5
NORTHEAST	26,798	27,340	28,288	20.1	+2.0	20.2	+3.5
Michigan	5,103	5,253	5,528	3.9	+2.9	3.9	+5.2
Wisconsin	23,000	23,230	23,800	17.1	+1.0	17.0	+2.5
Minnesota	10,061	10,341	10,913	7.6	+2.8	7.8	+5.5
LAKE STATES	38,164	38,824	40,241	28.6	+1.7	28.7	+3.6
Ohio	4,385	4,550	4,760	3.3	+3.8	3.4	+4.6
Indiana	2,282	2,334	2,364	1.7	+2.3	1.7	+1.3
Illinois	2,604	2,657	2,706	2.0	+2.0	1.9	+1.8
Iowa	4,298	4,301	4,339	3.2	+.1	3.1	+.9
Missouri	2,877	2,905	3,100	2.1	+1.0	2.2	+6.7
CORN STATES	16,446	16,747	17,269	12.3	+1.8	12.3	+3.1
North Dakota	995	1,020	1,067	.8	+2.5	.8	+4.6
South Dakota	1,757	1,762	1,829	1.3	+.3	1.3	+3.8
Nebraska	1,400	1,340	1,415	1.0	−4.3	1.0	+5.6
Kansas	1,397	1,356	1,382	1.0	−2.9	1.0	+1.9
NORTHERN PLAINS	5,549	5,478	5,693	4.0	−1.3	4.1	+3.9
Virginia	2,015	2,059	2,070	1.5	+2.2	1.5	+.5
West Virginia	350	349	380	.3	−.3	.3	+8.9
North Carolina	1,654	1,686	1,711	1.2	+1.9	1.2	+1.5
Kentucky	2,281	2,364	2,414	1.7	+3.6	1.7	+2.1
Tennessee	2,300	2,326	2,250	1.7	+1.1	1.6	−3.3
APPALACHIAN	8,600	8,784	8,825	6.5	+2.1	6.3	+.5
South Carolina	552	567	573	.4	+2.7	.4	+1.1
Georgia	1,396	1,412	1,395	1.0	+1.1	1.0	−1.2
Florida	2,082	2,109	2,112	1.6	+1.3	1.5	+.1
Alabama	620	580	573	.4	−6.5	.4	−1.2
SOUTHEAST	4,650	4,668	4,653	3.4	+.4	3.3	−.3
Mississippi	860	900	883	.7	+4.7	.6	−1.9
Arkansas	793	828	873	.6	+4.4	.6	+5.4
Louisiana	996	975	955	.7	−2.1	.7	−2.1
DELTA STATES	2,649	2,703	2,711	2.0	+2.0	1.9	+.3
Oklahoma	1,150	1,165	1,173	.9	+1.3	.8	+.7
Texas	3,665	3,780	3,990	2.8	+3.1	2.9	+5.6
SOUTHERN PLAINS	4,815	4,945	5,163	3.6	+2.7	3.7	+4.4
Montana	331	341	355	.3	+3.0	.3	+4.1
Idaho	2,162	2,253	2,298	1.7	+4.2	1.6	+2.0
Wyoming	136	137	136	.1	+.7	.1	−.7
Colorado	928	972	987	.7	+4.7	.7	+1.5
New Mexico	671	812	938	.6	+21.0	.7	+15.5
Arizona	1,133	1,202	1,237	.9	+6.1	.9	+2.9
Utah	1,110	1,162	1,172	.9	+4.7	.8	+.9
Nevada	223	225	237	.2	+.9	.2	+5.3
MOUNTAIN	6,694	7,104	7,360	5.2	+6.1	5.3	+3.6
Washington	3,017	3,222	3,482	2.4	+6.8	2.5	+8.1
Oregon	1,220	1,301	1,363	1.0	+6.6	1.0	+4.8
California	14,248	14,528	14,758	10.7	+2.0	10.5	+1.6
Alaska	13	14	14	(2)	+7.7	(2)	0
Hawaii	150	144	149	.1	−4.0	.1	+3.5
PACIFIC	18,648	19,209	19,766	14.1	+3.0	14.1	+2.9
UNITED STATES	133,013	135,802	139,969	100.0	+2.1	100.0	+3.1

[1]Preliminary. [2]Less than 0.05 percent.

Table 5.—Milk cows and replacements, 1981-84

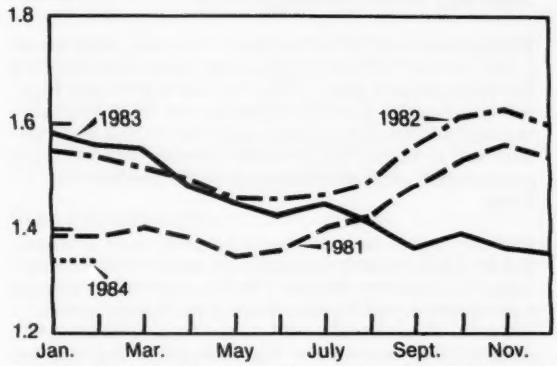
Date	Milk cows (1,000 head)	Replacement heifers, 500 pounds and over	
		Number	Number per 100 cows
1981			
January 1	10,860	4,345	40.0
July 1	10,920	4,628	42.4
1982			
January 1	11,012	4,532	41.2
July 1	11,020	4,780	43.4
1983			
January 1	11,076	4,533	40.9
July 1	11,120	4,880	43.9
1984			
January 1	11,140	4,541	40.8

Table 6.—Milk/16-percent feed price relationship, by months, 1981-84[1]

Month	1981	1982	1983	1984
		Pounds		
January	1.39	1.55	1.58	1.34
February	1.39	1.54	1.56	1.34
March	1.41	1.52	1.55	
April	1.39	1.50	1.48	
May	1.35	1.46	1.45	
June	1.36	1.46	1.43	
July	1.40	1.47	1.45	
August	1.43	1.49	1.41	
September	1.48	1.56	1.36	
October	1.53	1.61	1.39	
November	1.56	1.62	1.36	
December	1.54	1.60	1.35	
Average	1.44	1.53	1.45	

[1]Pounds of 16-percent protein ration equal in value to 1 pound of milk.

Milk/16-Percent Feed Price Relationship*



*Pounds of 16% protein ration equal in value to one pound of milk sold to plants and dealers.

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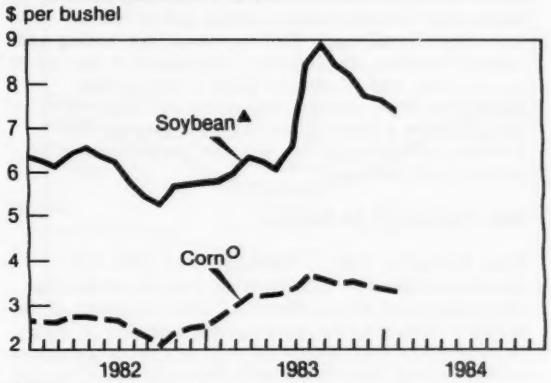
Corn and Soybean Prices



○#2 yellow: St. Louis ▲#1 yellow: Illinois processor

USDA

Table 7.—Corn, soybean meal, and 16-percent dairy feed ration prices, 1982-84

Month	Corn, No. 2 St. Louis			Soybean meal, Decatur			16-percent dairy feed		
	1982	1983	1984	1982	1983	1984	1982	1983	1984
		$/bu.			*$/ton*			*$/ton*	
January	2.65	2.52	3.41	191.0	179.3	201.0	181	175	205
February	2.61	2.79	3.31	191.0	177.1	185.6	180	177	201
March	2.66	2.99		183.6	177.3		179	175	
April	2.78	3.24		190.2	186.8		179	182	
May	2.78	3.24		192.4	185.8		181	184	
June	2.75	3.27		183.6	175.5		179	184	
July	2.68	3.39		181.9	189.3		180	182	
August	2.42	3.68		169.0	232.8		177	189	
September	2.32	3.60		160.8	233.6		173	198	
October	2.12	3.50		157.0	228.6		171	199	
November	2.43	3.53		173.4	224.7		172	205	
December	2.49	3.45		178.5	218.0		174	205	
Average[1]	2.56	3.27		179.4	200.7		177	188	

[1]Simple average of monthly prices.

January 1, 1984, soybean stocks indicate that disappearance was 688 million bushels during September-December 1983, less than 1 percent below a year earlier. Disappearance during January-August 1984 must be nearly 20 percent below a year earlier to maintain stocks projected for this summer. This suggests that prices will rise in the coming months, but any increase will likely be moderated by this spring's South American harvest and the outlook for the 1984 U.S. crop.

Soybean acreage is expected to be larger this year, and with a normal yield, a crop of around 2.1 billion bushels could be harvested. That would allow stocks to be enlarged somewhat, thus prices would likely move below a year earlier this fall. With higher bean prices in coming months, soybean meal prices are expected to move higher and then decline this fall as bean prices move lower.

The hay supply for 1983/84 (May-April) was 171.1 million tons, about 3 percent less than a year earlier. Meanwhile, use during May-December 1983 was 81 million tons, up significantly from the 69.5 million fed a year earlier. The increased use was due to the drought's effect on ranges and pastures that forced farmers in some areas to begin feeding earlier and at heavier amounts than normal. With increased hay feeding and reduced supplies, the January 1 inventory of hay, at 90.7 million tons, was 16 percent below a year earlier. Because of lower supplies, hay prices are expected to remain above a year earlier until late spring. Mid-February prices for all hay were $81.20 per ton, up 10 percent from last year.

Milk Production To Decline

From November 1983 to February 1984, milk cow numbers declined by 212,000 head, and the decline has likely continued during March. Under provisions of the paid diversion program, participants indicated in their required plans that additional milk cow slaughter above normal culling rates in January-February would be 129,700 head and that they would cull 32,900 more in March. In addition, dairy farmers that are not in the diversion program have already and likely will cull intensively because of lower effective receipts for milk, higher feed costs, and improved farm and off-farm employment opportunities. As a result, the average number of milk cows on farms is expected to decline 3 to 4 percent this year. This means that dairy cow slaughter this year will be about 3.6 million head, an increase of about 500,000 from 1982 and 1983 (assuming that the same percentage of replacement heifers enter the herd as in 1982 and 1983).

Table 8.—Utility cow prices, Omaha, by months, 1980-83

Month	1981	1982	1983	1984
		Dollars per cwt		
January	41.61	36.64	36.94	33.26
February	43.65	38.11	40.92	39.69
March	43.12	39.41	42.36	
April	43.95	41.26	43.04	
May	42.39	43.40	42.98	
June	42.88	42.73	42.26	
July	43.78	42.52	41.14	
August	44.31	42.25	39.63	
September	42.47	39.71	37.75	
October	40.60	39.28	37.42	
November	38.71	36.58	34.14	
December	36.65	35.41	33.58	
Average	41.93	39.96	39.35	

Milk output per cow in 1984 is projected to be unchanged to down 1 percent. If yields do decline, it would be the first drop since 1973. The possible drop will be brought about because some producers participating in the diversion program will obtain part or all of their marketing reduction through lower output per cow caused by reduced feeding rates or other management practices.

Because of the expected decline in cow numbers and a possible small drop in output per cow, milk production is projected to be lower than a year earlier for the next 12 months. Milk production in calendar 1984 is expected to total 3 to 5 percent less than 1983's record 140 billion pounds.

PRICES AND INCOME

Farm Milk Prices To Remain Lower

Milk prices received by farmers in February were below a year earlier, because of continued surplus supplies and the lower support price. Prices for the last 3 years have fallen seasonally about 60 cents per cwt from February through midsummer, but this year the decline could be only half as large. With a better balance between supply and demand, some price strength could develop after flush.

February prices for manufacturing grade milk averaged $12.40 per cwt, down seasonally 10 cents from January. Reported prices for the last 3 months have been 40 cents a cwt below a year earlier. During April-June, prices will be down seasonally and are expected to be 30 to 40 cents below a year earlier. This summer, prices may be 10 to 30 cents lower than last year and by year's end, manufacturing grade milk prices could exceed a year earlier.

The minimum Federal order Class I price for April will be $14.21 per cwt, up 1 cent from March, but 53 cents below a year earlier. The Minnesota-Wisconsin (M-W) manufacturing grade milk price, the mover of class prices in all Federal order markets, is expected to strengthen somewhat after flush and during the rest of the year. Thus, minimum Federal order Class I prices are projected to be above a year earlier during early 1985.

Estimated average over-order payments on Class I milk in Federal order markets increased in recent months. During February and March the estimated average payment was 59 cents per cwt, up 9 cents from January. Negotiated prices charged by cooperative associations dropped, but not as much as the decline in minimum order Class I prices. Minimum Class I prices (which are based on the M-W price for the second preceding month) declined 45 cents between January and February. The corresponding drop in negotiated over-order prices was 36 cents. However, over-order payments in March were nearly the same as last fall and a year earlier.

Table 9.—Milk prices received by farmers, by months, 1981-84

Month	All sold to plants				Manufacturing grade			
	1981	1982	1983	1984	1981	1982	1983	1984
	Dollars per cwt							
January	14.10	14.00	13.80	13.60	13.00	13.00	12.90	12.50
February	14.00	13.80	13.80	13.50	12.90	12.80	12.80	12.40
March	13.80	13.70	13.60		12.80	12.70	12.70	
April	13.70	13.50	13.50		12.70	12.60	12.70	
May	13.50	13.20	13.30		12.60	12.40	12.50	
June	13.40	13.20	13.20		12.50	12.30	12.40	
July	13.40	13.20	13.20		12.40	12.30	12.30	
August	13.50	13.30	13.30		12.40	12.30	12.20	
September	13.70	13.60	13.50		12.60	12.60	12.50	
October	14.00	13.80	13.80		12.90	12.90	12.80	
November	14.00	13.90	13.90		13.00	13.00	13.00	
December	14.00	13.90	13.80		13.00	13.00	12.60	
Average[1]	13.76	13.59	13.56		12.73	12.66	12.62	

[1]Simple average of reported monthly prices.

Prices received by U.S. farmers for all milk during January-February averaged $13.55 per cwt, 25 cents below a year earlier. The all-milk price during March-June is expected to be 30 to 40 cents below a year earlier, with a seasonal decline of 50 to 70 cents from February to June. The all-milk price is expected to strengthen somewhat above the rate of recovery that occurred during the summer and fall of 1981-83, so that by yearend it will likely equal a year earlier. The average all-milk price this year is expected to be 10 to 30 cents below 1983. The effective all-milk price (adjusted for differences in deductions) may be down 20 to 40 cents.

Cash Receipts Larger

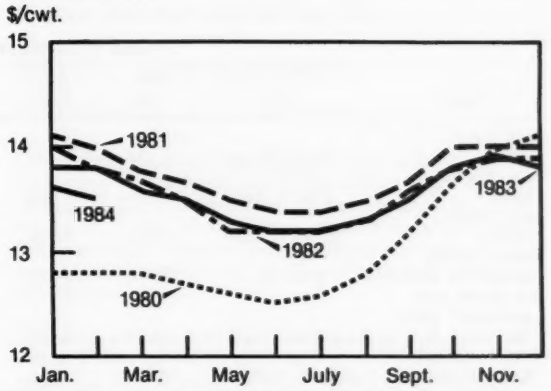
Cash receipts during 1983 are estimated at $18.8 billion, up about 2.9 percent. Total marketings were likely up 3.1 percent to 137.6 billion pounds, while the all-milk price was down about 0.2 percent. However, if adjusted to account for net deductions (deductions less refunds), effective cash receipts were down about 0.7 percent.

Wholesale Prices Lower

Surplus supplies and the lower CCC purchase prices are being reflected in wholesale prices for butter, cheddar cheese, and nonfat dry milk. Butter (Grade A, Chicago) during February averaged 141.25 cents per pound, 6 cents lower than a year earlier and 2 cents below the current CCC purchase price. Likewise, nonfat dry milk (high heat, Central States area) at 90.75 cents during February, was below year-earlier and purchase price levels—2.6 cents and 0.25 cents, respectively. Meanwhile, the price of cheddar cheese (Wisconsin assembly points, 40-lb. blocks) averaged 135.47 cents per pound, nearly 3 cents below a year earlier, but about 0.7 cents higher than the CCC purchase price.

Reflecting lower wholesale spot prices, the Bureau of Labor Statistics (BLS) wholesale price index for all dairy products in February was down from November 1983 and 0.9 percent below a year earlier. February marked the third month that the index was below year-earlier levels. Last year, the index averaged 250.6 (1967 =100), a gain of only 0.7 percent from 1982 and the smallest rise since 1965. For the year, wholesale price gains in ice cream

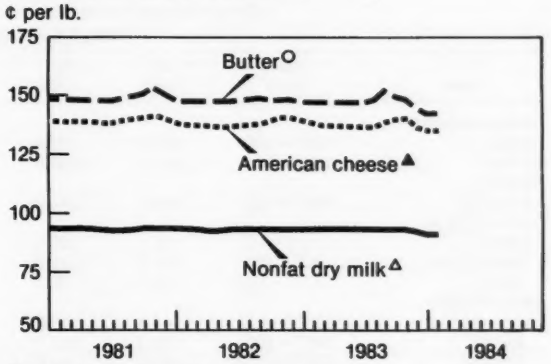
All Milk Prices*



*U.S. average price received by farmers for deliveries to plants and dealers.

USDA Neg. ERS 5449-84(3)

Wholesale Dairy Product Prices



○Grade AA Chicago. △High-heat, central-states.
▲40-lb. block, Wisconsin assembly points.

USDA Neg. ERS 79-84(3)

Table 10.—Wholesale dairy product prices and indexes

Item	Unit	Feb. '82	Aug. '82	Avg. '82	Feb.'83	Aug. '83	Avg. '83	Jan. '84	Feb. '84
Butter, A, Chicago	cents/lb	147.47	148.07	147.69	147.25	147.75	147.30	140.44	141.25
Cheese, 40-lb blocks, Wisconsin assembly points	cents/lb	137.78	137.76	138.27	138.38	137.05	138.28	135.79	134.47
Nonfat dry milk, Central States, high heat	cents/lb	93.12	93.12	93.15	93.38	93.38	93.19	90.75	90.75
Wholesale price index (all dairy products)	1967=100	248.0	248.8	248.9	250.9	250.4	250.6	248.5	248.6
Fresh whole milk	1967=100	196.8	198.2	197.9	199.9	199.6	199.7	199.6	199.3
Butter	1967=100	227.2	227.4	226.9	226.4	226.8	226.5	218.0	219.2
Cheese	1967=100	312.3	315.8	313.2	315.0	313.2	314.1	308.9	309.0
Nonfat dry milk	1967=100	464.0	461.5	462.9	462.7	462.7	462.4	NA	NA
Ice cream	1967=100	233.9	235.1	235.9	239.7	239.5	239.8	240.4	242.5

NA = Not available.

Table 11.—Retail dairy product prices

Item	Unit	Jan. 1982	Dec. 1982	Avg. 1982	Jan. 1983	Aug. 1983	Dec. 1983	Avg. 1983	Jan. 1984
Milk, fresh, whole[1]	$ per 1/2 gal	1.134	1.126	1.124	1.134	1.130	1.123	1.128	1.124
Milk, fresh, skim	$ per 1/2 gal	.988	.984	.979	.993	.988	.975	.986	.999
Milk, fresh, lowfat	$ per 1/2 gal	1.072	1.062	1.062	1.068	1.082	1.060	1.074	1.067
Butter, salted, Grade AA, sticks	$ per lb	2.019	2.026	2.046	2.048	2.065	2.043	2.066	2.055
Ice cream, prepackaged, bulk, regular	$ per 1/2 gal	2.128	2.163	2.102	2.179	2.135	2.184	2.158	2.189
Yogurt, natural, fruit-flavored	$ per 1/2 pt	NA	.513	.503	.514	.525	.521	.514	.522

[1]Vitamin fortified. NA = Not available.

Table 12.—Retail price indexes[1]

Item	Index base	Jan. 1981	Dec. 1982	Avg. 1982	Jan. 1983	Aug. 1983	Dec. 1983	Avg. 1983	Jan. 1984
Consumer price index	1967=100	282.5	292.4	289.1	293.1	300.3	303.5	298.4	305.2
All food	1967=100	281.0	286.5	285.7	288.1	292.2	293.9	291.7	299.4
All dairy products	1967=100	245.8	247.8	247.0	249.5	250.2	249.9	249.9	250.8
Fluid milk and cream	12/77=100	135.1	135.5	135.4	136.7	136.5	135.9	136.4	136.3
Whole milk	1967=100	221.2	221.9	221.4	223.7	223.2	222.3	222.9	222.7
Other	12/77=100	135.1	135.2	135.6	136.9	136.8	136.2	136.7	137.3
Manufactured dairy products	12/77=100	144.4	146.6	145.6	147.1	148.4	148.8	148.3	149.3
Butter	1967=100	249.3	252.1	251.1	253.4	254.2	254.1	254.0	254.7
Cheese	12/77=100	142.0	144.6	143.9	145.2	146.4	146.4	146.3	147.0
Frozen desserts	12/77=100	150.8	151.8	150.4	152.5	152.5	154.0	153.2	154.8
Other	12/77=100	138.4	141.7	140.2	141.6	145.9	146.0	144.4	146.1

[1]For all urban consumers.

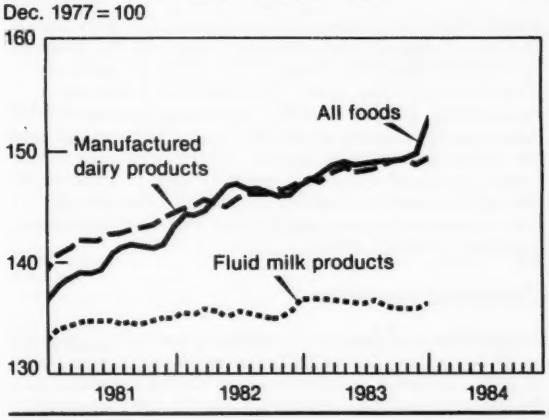
(1.7 percent) and fresh whole milk (0.9 percent) were above the average rate of gain in the industry, while the small gain in cheese (0.3 percent) and the slight declines for butter (0.2 percent) and nonfat dry milk (0.1 percent) worked to lower the average gain in the index.

Because of continued large supplies, wholesale spot prices are expected to remain near current levels and below year-earlier levels until late summer. The BLS wholesale price index for all dairy products is also expected to remain below a year earlier through midsummer. With supply and use expected to be in better harmony later this year, some price strength could occur this fall. For all of 1984, the BLS wholesale dairy index is expected to average 1 percent lower to 1 percent higher than last year.

Retail Prices Up Less Than All Food

In January, the BLS retail index for all dairy products stood at 250.8 (1967 =100), up 0.5 percent from a year earlier. In contrast, the all-food index was up 3.9 percent. In 1984, retail dairy prices are expected to be unchanged to 2 percent higher, while all food prices increase 4 to 7 percent above 1983. The dairy products index averaged 249.9 in 1983, a 1.2-percent gain from 1982, while the all-food index increased 2.1 percent.

Retail Food and Dairy Product Prices



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In 1983, retail prices for a half-gallon of Grade A, vitamin-fortified, whole milk averaged 112.8 cents, up slightly from a year earlier and a penny higher than 1981. In contrast, retail prices rose an average of 6 cents per year from 1976 to 1981. The 1983 farm value was 59.4 cents, about the same as the past 2 years. The farmer's share of the retail price was 53 percent, unchanged from a year earlier.

Procurement and assembly charges in 1983 were the lowest since 1979, primarily because of lower over-order charges. Meanwhile, processing and wholesaling margins also fell in 1983, and took the smallest share of retail prices since 1976. With higher retail prices and lower wholesale prices, the retail margin expanded 2.4 cents. Retailers got nearly 14 percent of the consumer's dollar spent for fluid whole milk during 1983.

FEDERAL ORDER SUMMARY [1]

More Producers, Larger Deliveries

The average number of producers under Federal milk marketing orders continued to rise during 1983. An average of 121,050 producers delivered milk to handlers regulated under Federal orders, an increase of 300 over 1982's average. This marked the fourth consecutive year-to-year increase and the first 4-year gain since the 1957-61 period.

Producers delivered 95.8 billion pounds of milk to Federal order plants in 1983, up 4.2 billion pounds, or 4.5 percent, over the previous year. Federal order deliveries accounted for about 70 percent of all milk sold to plants

[1]Prepared by Eugene Krueger, Dairy Division, Agricultural Marketing Service, USDA (202) 447-7091.

Table 13—Grade A vitamin fortified whole milk: Farm value, marketing costs by function, and retail price per half-gallon

Year	Farm value	Marketing functions				Retail price
		Procuring	Processing	Wholesaling	Retailing	
			Cents			
1972	29.4	2.2	9.9	10.5	6.5	58.5
1973	33.2	2.5	11.6	11.6	5.1	64.0
1974	40.9	2.7	10.7	13.6	8.9	76.8
1975	41.2	2.8	11.4	13.6	7.9	76.9
1976	46.2	2.8	10.6	12.1	9.3	81.0
1977	45.1	2.9	13.2	12.6	8.3	82.1
1978	47.0	3.1	14.6	14.3	7.1	86.1
1979	52.2	3.8	15.1	16.6	8.3	96.0
1980	55.8	4.5	15.6	18.9	10.2	104.9
1981	59.5	4.7	16.0	19.1	12.4	111.7
1982	59.2	4.5	16.5	19.3	13.0	112.4
1983[1]	59.4	4.4	15.8	17.9	15.4	112.8

[1]Projected on basis of data for January-September.

and dealers during the year. The average daily delivery per producer continued its steady growth, reaching 2,167 pounds, an increase of 88 pounds, or 4.2 percent, from 1982.

Producer milk used in Class I or fluid milk products rose slightly to 41.1 billion pounds, 0.7 percent above 1982's total. Despite the increase in Class I use, the greater rise in producer deliveries caused the annual Class I utilization to drop 2 percentage points to 43 percent.

The M-W price series averaged $12.49 per cwt in 1983, up 1 cent from the preceding year. This stability was evident in Class I prices, which averaged $14.69 per cwt, up only 6 cents from 1982. Federal order minimum blend prices averaged $13.53, the same as in 1982. Estimated annual over-order payments on Class I milk dropped 3 cents from 1982, averaging 58 cents per cwt and ranging from 52 to 63 cents on a monthly basis in 1983.

During 1983, sales of fluid milk products in Federal order marketing areas increased 0.2 percent from the previous year, the first increase in 5 years. The rise can be attributed to the relatively small decline in whole milk items. The 2.3-percent drop in fluid whole milk products was the smallest since 1975. Sales of lowfat and skim milk items, which have continued increasing over time, rose 3.1 percent for the year, a rebound from 1982's relatively low gain of 1.4 percent.

On January 1, 1984, the Puget Sound and Inland Empire marketing areas were combined into a single Puget Sound-Inland marketing area. This action reduced the number of Federal orders to 45. The merger has been challenged by a group of producers in the area, and a decision by the District Court for the area is pending.

Update on Reconstituted Milk Suit

In November 1983, the U.S. Supreme Court accepted the Government's petition to review the decision of the U.S. Court of Appeals for the District of Columbia involving the suit filed by the Community Nutrition Institute (CNI) against USDA to modify the Federal order pricing procedures for reconstituted milk. The expectation is that the Supreme Court will hand down its decision before recessing in July.

The issue before the court is whether individual consumers may sue the Secretary of Agriculture under the Agricultural Marketing Agreement Act of 1937. The U.S. District Court had upheld the USDA on its claim that petitioners CNI and the three consumers did not have standing to sue, and that a third petitioner, a regulated milk handler, had not exhausted available administrative appeals before going to court. The Court of Appeals reversed this decision in part by saying that consumers did have standing to sue.

The key issue in the case (legality of current pricing of reconstituted milk under Federal orders) has not yet been decided by the courts, and remains in the wings pending resolution of the consumer's right to sue.

UTILIZATION

Manufactured Output Larger

Production of manufactured dairy products on a milk-equivalent, fat-solids basis during fourth-quarter 1983 rose 2.4 percent from 1982. As a result, total use of milk in manufactured products during 1983 was a record 84 billion pounds, a gain of 4.2 percent. The increase resulted from nearly unchanged fluid sales and larger milk marketings (production) during 1983.

Most of the 3.4-billion-pound increase in raw milk use in the manufactured products sector went into the products that USDA purchases. Butter and nonfat dry milk production in 1983 rose nearly 4 percent and 8 percent, respectively, and used 1 billion additional pounds of milk. American-type cheese production rose 6 percent and used 1.6 billion more pounds of milk. Of the remaining 0.8 billion pounds of additional raw milk used in 1983, about 500 million went to produce 3.8 percent more cheese-not-of-American-types, and the rest was used to produce 4 percent more ice cream.

Commercial Use Higher

Commercial disappearance of all milk and dairy products (milk-equivalent, fat-solids basis) was weak during most of 1983. However, a 3-percent gain during October-December raised total disappearance for 1983 about 0.3 percent above a year earlier. Gains in 1984 are not likely to be as strong as in fourth-quarter 1983, but use is anticipated to be up 1 to 3 percent. The expected increase is the result of a lower support price for milk that will help hold down retail dairy product prices, the improving economy, and the national dairy product promotion program that will become effective later this year.

Table 14.—Production of selected manufactured dairy products, annual, 1981-83

Item	Units	1981	1982	1983[1]	Change from year earlier	
					1982	1983[1]
Butter	Mil. lb	1,228.2	1,257.0	1,306.3	+2.3	+3.9
American cheese	Mil. lb	2,642.3	2,750.5	2,916.5	+4.1	+6.0
Other cheese	Mil. lb	1,635.3	1,789.4	1,857.1	+9.4	+3.8
Cottage cheese[2]	Mil. lb	981.7	966.4	963.8	−1.6	−.3
Canned milk	Mil. lb	757.9	734.9	660.8	−3.0	−10.1
Dry whole milk	Mil. lb	92.7	102.2	109.1	+10.2	+6.8
Ice cream	Mil. gal	832.4	851.7	887.4	+2.3	+4.2
Milk equivalent[3]	Bil. lb	77,916	80,583	[4]84,000	+3.4	+4.2
Nonfat dry milk	Mil. lb	1,314.3	1,400.6	1,512.6	+6.6	+8.0

[1]Preliminary. [2]Creamed and lowfat. [3]Total reported manufactured products using unrounded data. [4]Estimated.

Table 15.—Wisconsin out-of-State milk shipments

Month	1982[1]		1983[1]		1984[1]	
	Loads	Volume	Loads[2]	Volume[3]	Loads[2]	Volume[3]
	Number	*Thousand pounds*	*Number*	*Thousand pounds*	*Number*	*Thousand pounds*
January	57	2,679	13	611	44	2,156
February	31	1,457	7	329	42	2,058
March	20	940	1	47		
April	7	329	1	47		
May	15	705	9	423		
June	22	1,034	3	141		
July	25	1,175	28	1,372		
August	23	1,081	62	3,038		
September	68	3,196	258	12,642		
October	20	940	57	2,793		
November	50	2,350	54	2,646		
December	14	658	50	2,450		
Total	352	16,544	543	26,539		

[1]Changes in marketing practices in the Chicago market and adjacent Federal order markets may affect the comparability of these data. [2]Includes out-of-State skim milk shipments. [3]Average weight of load increased from 47,000 pounds to 49,000 after July 1, 1983.

Table 16.—Commercial disappearance: Total milk, annual and quarters, 1981-83[1]

Item	1981	1982					1983[2]				
		Quarters				Year	Quarters				
	Year	I	II	III	IV		I	II	III	IV	Year
						Billion pounds					
Production	133.0	33.2	35.7	34.0	32.9	135.8	34.2	36.9	35.0	33.8	140.0
Farm use	2.3	.6	.6	.6	.6	2.3	.6	.6	.6	.6	2.4
Marketings	130.7	32.7	35.1	33.4	32.3	133.5	33.7	36.3	34.4	33.2	137.6
Beginning commercial stocks	5.8	5.4	5.2	5.0	4.6	5.4	4.6	5.0	5.1	5.4	4.6
Imports	2.3	.4	.6	.6	.9	2.5	.6	.5	.6	.9	2.6
Total supply	138.8	38.5	40.9	39.0	37.7	141.3	38.9	41.9	40.1	39.5	144.8
Ending commercial stocks	5.4	5.2	5.0	4.6	4.6	4.6	5.0	5.1	5.4	5.2	5.2
Net removals	12.9	4.7	4.9	2.6	2.1	14.3	5.6	5.8	3.1	2.3	16.8
Commercial disappearance (actual)	120.5	28.7	30.9	31.8	31.1	122.4	28.2	31.0	31.6	32.0	122.8
Percent change[3]	[4]+1.4	+2.6	+2.1	+0.2	+1.6	+1.6	−1.6	+0.3	−0.5	+3.0	+0.3

[1]Milk-equivalent, fat-solids basis. Totals may not add because of rounding. [2]Preliminary. [3]From year earlier, using unrounded data. [4]On a daily average basis.

Commercial disappearance of butter during the fourth quarter of 1983 was up nearly 1 percent from a year earlier, leaving use for the year down about 1 percent. American cheese sales showed strong growth—up 10 percent—during October-December 1983 relative to a year earlier. For the year, sales of American-type cheese were down about 4.3 percent. Sales of cheese-not-of-American-types were up about 2 percent last fall and 2.6 percent for all of 1983. Also posting sales gains during 1983 were nonfat dry milk, up 5.5 percent, and frozen products, up nearly 1 percent. Meanwhile, canned milk sales were down 8.8 percent.

Per Capita Use Higher

Civilian per capita domestic disappearance (including USDA donations) increased 16 pounds to 578 on a milk-equivalent, fat-solids basis during 1983. Although per capita commercial sales were slightly lower, the 60-percent increase in USDA donations brought the expansion. Per capita disappearance for butter (up 0.5 pounds), cheese (up 0.3 pounds), and ice cream (up 0.5 pounds) overcame the declines in fluid milk (down 5.4 pounds) and canned milk (down 0.2 pounds). During 1983, USDA donated 285 million pounds of butter, up 75 percent from 1982. Cheese donations totaled 634 million pounds, a 48-percent gain. Canned milk, at 24.6 million, was 18 percent more than in 1982, while nonfat dry milk giveaways increased by 53 percent. On a fat-solids basis, domestic donations equaled 12.2 billion pounds of milk in 1983.

USDA Stocks Decline

Milk-equivalent stocks held by USDA on February 1 were 17.2 billion pounds, down 1.8 billion from October 1, 1983. From October 1, 1982, to February 1, 1983, milk-equivalent stocks fell only 450 million pounds.

Table 17.—Commercial disappearance: Selected dairy products, 1976-83[1]

Year	Butter[2]	Cheese		Nonfat dry milk	Canned milk	Frozen products[4]
		American[3]	Other			
		Million pounds				*Million gallons*
1976	919.0	1,920.9	1,458.0	719.2	899.0	1,154.0
1977	859.8	1,958.8	1,512.3	682.2	775.2	1,167.6
1978	903.5	2,064.7	1,655.5	658.4	776.1	1,173.5
1979	895.0	2,113.1	1,730.4	603.1	773.7	1,152.1
1980	878.8	2,023.9	1,827.9	538.9	732.5	1,166.9
1981-1st Qtr.	188.9	528.4	432.5	104.6	177.9	249.0
2nd Qtr.	214.2	518.3	450.4	86.2	159.2	326.5
3rd Qtr.	222.9	544.7	459.8	155.4	167.1	347.7
4th Qtr.	243.2	556.5	532.9	118.0	246.0	244.6
Total	869.2	2,147.9	1,875.6	464.1	750.4	1,167.7
1982-1st Qtr.	211.4	541.3	462.9	105.0	170.6	249.3
2nd Qtr.	217.6	546.1	484.5	75.5	150.1	333.7
3rd Qtr.	217.3	549.4	501.0	147.1	164.7	345.8
4th Qtr.	251.0	528.1	596.2	120.2	230.0	247.5
Total	897.3	2,165.0	2,044.6	447.8	715.3	1,176.2
1983-1st Qtr.[5]	208.3	459.2	496.2	109.0	163.3	263.2
2nd Qtr.[5]	208.5	558.4	496.5	111.2	153.0	348.4
3rd Qtr.[5]	219.0	473.3	498.3	129.4	131.9	369.6
4th Qtr.[5]	253.0	581.2	607.0	93.1	204.1	253.8
Total[5]	888.0	2,072.1	2,097.9	472.6	652.4	1,235.0

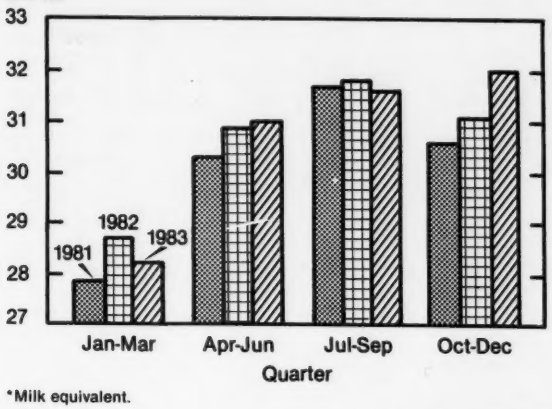
[1]Total may not add because of rounding. [2]Imports include butter-equivalent of butteroil. [3]Imports include Colby cheese; stocks do not include processed cheese. [4]Excludes Mellorine. [5]Preliminary.

Table 18.—Factors influencing and indicative of the demand for milk and dairy products, selected years, 1960-83

Year	Total population July 1 (including armed forces overseas)	Total civilian employment	Per capita disposable income		Civilian per capita disappearance				Retail price indexes		
			Current R	Deflated by consumer price index[1] R	Milk-equivalent	Milk solids		Margarine	Consumer price	All foods	Dairy products
					Fat-solids basis	Milk-fat	Solids-not-fat				
	Million		*Dollars*		*Pounds*				*1967=100*		
1960	180.7	65.8	1,947	2,195	653	24.5	41.4	9.4	88.7	88.0	88.4
1965	194.3	71.1	2,448	2,590	620	22.9	40.6	9.9	94.5	94.4	90.0
1966	196.6	72.9	2,613	2,688	604	22.3	40.3	10.5	97.2	99.1	95.8
1967	198.7	74.4	2,757	2,757	581	21.4	39.5	10.5	100.0	100.0	100.0
1968	200.7	75.9	2,956	2,837	577	21.2	39.7	10.8	104.2	103.6	103.3
1969	202.7	77.9	3,152	2,871	569	20.9	39.5	10.8	109.8	108.9	106.7
1970	205.1	78.7	3,390	2,915	561	20.6	39.7	11.0	116.3	114.9	111.8
1971	207.7	79.4	3,620	2,984	556	20.4	39.7	11.1	121.3	118.4	115.3
1972	209.9	82.2	3,860	3,081	558	20.5	39.4	11.3	125.3	123.5	117.1
1973	211.9	85.1	4,315	3,242	551	20.2	39.5	11.2	133.1	141.4	127.9
1974	213.9	86.8	4,667	3,160	539	19.8	37.9	11.2	147.7	161.7	151.9
1975	216.0	85.8	5,075	3,148	540	19.8	37.5	11.1	161.2	175.4	156.6
1976	218.0	88.8	5,477	3,212	540	19.8	38.2	12.0	170.5	180.8	169.3
1977	220.2	92.0	5,965	3,286	542	19.8	37.6	11.4	181.5	192.2	173.9
1978	222.6	96.0	6,621	3,388	545	20.0	37.3	11.3	195.4	211.4	185.6
1979	225.1	98.8	7,331	3,372	548	20.1	37.2	11.3	217.4	234.5	207.1
1980	227.7	99.3	8,032	3,254	544	19.9	36.5	11.5	246.8	254.6	227.4
1981	229.8	100.4	8,906	3,269	543	[2]19.3	[2]36.4	11.3	272.4	274.6	243.6
1982	232.1	99.5	9,377	3,244	562	[2]20.5	[2]36.1	11.2	289.1	285.7	247.0
1983[2]	244.2	100.8	9,968	3,340	578	[3]21.1	[3]37.0	[3]11.0	298.4	291.7	249.9

[1]1967 dollars. [2]Preliminary. [3]Estimated. R = Revised series.

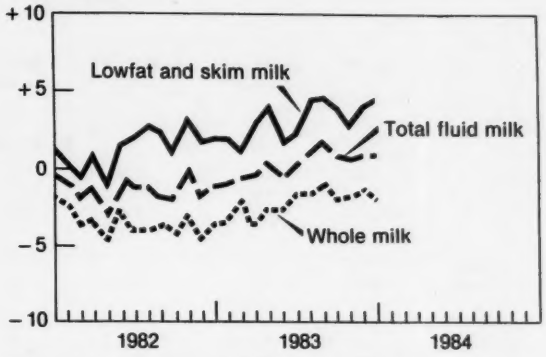
Commercial Disappearance of Milk in All Products*



*Milk equivalent.

USDA Neg. ERS 2075-84(3)

Daily Average Sales of Fluid Milk Items



*From year earlier. Adjusted for calendar composition.

USDA Neg. ERS 2705-84(3)

Table 19.—Per capita civilian consumption of selected dairy products, 1970-83

Year	Fluid milk and cream[1]	Butter	American cheese	Other cheese	Canned milk	Ice cream	Whole dry milk	Nonfat dry milk
				Pounds				
1970	263	5.3	7.1	4.4	5.9	17.6	.2	5.3
1971	259	5.1	7.4	4.7	5.7	17.5	.2	5.3
1972	262	4.9	7.8	5.3	5.1	17.3	.1	4.6
1973	255	4.8	7.9	5.7	4.8	17.3	.1	5.3
1974	243	4.5	8.6	6.0	4.4	17.4	.1	4.2
1975	243	4.7	8.2	6.1	3.9	18.5	.1	3.3
1976	242	4.3	9.0	6.7	3.7	17.9	.2	3.5
1977	239	4.3	9.3	6.8	3.2	17.5	.2	3.3
1978	235	4.4	9.6	7.4	3.1	17.4	.2	3.1
1979	232	4.5	9.6	7.6	3.0	17.1	.3	3.3
1980	227	4.5	9.7	7.9	2.8	17.4	.3	3.0
1981	222	4.3	10.3	8.1	2.9	17.2	.2	2.6
1982	216	4.6	11.5	8.6	2.8	17.5	.1	2.7
1983[2]	210	5.1	11.6	8.9	2.6	18.1	.2	3.2

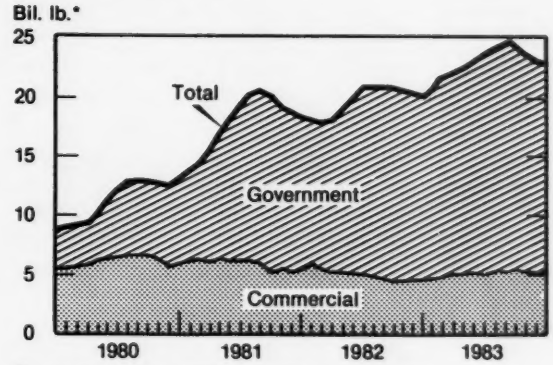
[1]Milk-equivalent, fat-solids basis. [2]Preliminary.

Table 20.—Dairy product stocks, February 1, 1982-84

Item	1982	1983	1984
		Million pounds	
Commercial:			
Butter	59.2	29.7	36.2
American cheese	374.8	341.6	353.7
Other cheese	85.4	87.2	105.2
Nonfat dry milk	87.7	84.4	66.0
Milkfat	200.6	166.6	181.2
Solids-not-fat	238.0	224.2	215.2
Milk-equivalent, fat-solids basis	5,656.0	4,725.2	5,097.3
Government:			
Butter	371.4	455.8	458.1
American cheese[1]	500.4	655.8	787.6
Nonfat dry milk	820.5	1,207.6	1,347.3
Milkfat	459.9	578.2	623.7
Solids-not-fat	943.6	1,363.9	1,541.9
Milk-equivalent, fat-solids basis[1]	12,608.7	15,893.6	17,244.1

[1]Includes processed American cheese stocks held by CCC.

Dairy Product Stocks:○ Milk Equivalent Fat Solids Basis, Beginning Jan. 1



○As of first of month. *Milk equivalent, fat-solids basis.

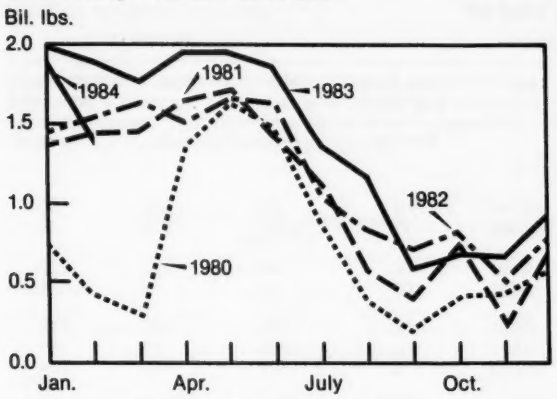
USDA ERS 8448-84(3)

Table 21.—Dairy products removed from the commercial market by programs of the USDA, 1978-84

Year and month	Removals[1]					Solids content of removals			
	Butter[2]	American cheese[3]	Evaporated milk[4]	Nonfat dry milk[5]	Milk equivalent	Milkfat	Solids-not-fat	As a percentage of marketings	
								Milkfat	Solids-not-fat
	Million pounds							*Percent*	
1978	112.0	39.7	17.6	285.0	2,743	106.3	290.7	2.4	2.8
1979	81.6	40.2	16.4	255.3	2,119	81.7	261.8	1.8	2.5
1980	257.0	349.7	17.5	634.3	8,800	325.3	723.6	7.1	6.7
1981									
January	51.6	31.9	1.8	55.4	1,385	52.3	64.0		
February	49.3	43.5	1.8	60.7	1,451	54.3	72.6		
March	42.5	57.5	1.5	73.5	1,449	53.4	89.1		
April	46.7	70.1	1.1	87.4	1,660	60.9	106.3		
May	48.9	70.2	1.2	97.5	1,706	62.7	116.1		
June	31.4	79.5	2.6	102.4	1,439	51.8	123.8		
July	17.7	75.2	1.6	75.7	1,113	39.1	96.4		
August	12.1	33.3	1.5	70.0	581	21.1	78.0		
September	6.9	28.6	1.6	54.0	429	15.3	61.1		
October	23.5	27.2	1.2	65.3	756	28.2	71.6		
November	3.0	18.1	1.7	45.0	245	8.7	49.2		
December	17.9	28.0	1.2	64.3	648	24.0	70.9		
Total[7]	351.5	563.0	18.6	851.3	12,861	471.7	999.2	9.9	9.2
1982[6]									
January	55.1	32.9	.8	71.1	1,464	55.5	79.2		
February	56.7	38.3	1.5	71.9	1,553	58.6	81.8		
March	52.2	56.7	1.6	92.0	1,643	61.0	106.8		
April	44.5	69.6	1.4	95.0	1,609	59.0	113.5		
May	46.3	70.3	1.4	93.6	1,653	60.7	112.4		
June	39.9	80.2	2.7	120.7	1,623	59.0	141.7		
July	18.1	68.6	1.9	95.5	1,056	37.5	113.5		
August	12.5	59.2	1.9	72.6	848	29.8	88.5		
September	12.0	49.5	2.2	61.8	742	26.2	75.2		
October	21.3	38.1	2.0	53.4	820	29.9	63.7		
November	7.8	35.4	1.5	51.7	513	18.2	61.0		
December	15.5	43.7	1.8	68.7	756	27.2	80.0		
Total[7]	382.0	642.5	20.8	948.1	14,282	522.7	1,117.5	10.7	10.0
1983[6]									
January	66.6	60.1	2.1	81.8	1,973	73.7	98.2		
February	59.2	67.3	1.4	83.9	1,891	70.0	102.3		
March	46.7	82.3	1.9	106.0	1,782	65.0	128.1		
April	53.2	86.3	2.4	95.9	1,958	71.5	119.8		
May	55.5	83.0	1.7	111.8	1,971	72.3	134.0		
June	40.1	102.8	.8	123.7	1,847	66.3	151.2		
July	23.4	87.9	1.9	102.9	1,356	48.0	126.6		
August	16.6	84.2	1.8	104.0	1,179	41.3	126.5		
September	4.3	49.2	3.0	63.4	583	20.0	76.7		
October	18.1	30.6	2.8	62.4	681	25.1	70.1		
November	10.4	46.0	2.1	62.0	674	23.8	74.3		
December	19.0	52.9	2.6	63.2	920	33.0	77.7		
Total[7]	413.2	832.8	24.6	1,061.0	16,813	610.2	1,285.7	12.1	10.9
1984[6]									
January	61.2	62.5	3.3	76.2	1,889	70.2	93.8		
February	47.2	42.4	2.3	64.0	1,398	52.3	75.5		

[1]Delivery basis, after unrestricted domestic sales. [2]Includes butter-equivalent of anhydrous milkfat, PIK, and purchases under Sec. 709, and 4a. [3]Includes purchases under Sec. 709 and 4a. [4]Includes purchases under 4a. [5]Includes PIK certificates, and purchases under Sec. 709 and 4a. [6]Preliminary. [7]Totals may not add because of rounding.

USDA Dairy Product Purchases*



*Net removals, milk equivalent, fat-solids basis.

USDA Neg. ERS 8449-84(3)

Table 22.—Uncommitted CCC inventories, selected dates, 1981-84

Date	Butter	American cheese	Nonfat dry milk	Milk-equivalent, fat-solids basis
		Million pounds		*Billion pounds*
March 1, 1981	367.1	266.9	587.5	10.2
March 1, 1982	306.2	584.6	920.3	12.1
March 1, 1983	427.5	746.4	1,178.0	16.2
June 1, 1983	470.3	790.4	1,253.6	17.5
Sept. 1, 1983	457.5	928.9	1,348.8	18.6
Dec. 1, 1983	363.1	853.9	1,365.7	15.9
Jan. 1, 1983	341.7	838.3	1,372.3	15.3
Feb. 1, 1983	383.8	838.8	1,395.9	16.2
March 1, 1983	407.8	818.8	1,367.2	16.5

Government stocks are expected to continue to decline and be below a year earlier by early spring because of smaller purchases and continued large amounts of donations.

Total commercial dairy stocks on February 1 were slightly larger than a year earlier. Holdings by the trade may expand some late this summer if sales improve and production declines.

Net Removals Lower

USDA net removals under the milk price support program were a record 16.8 billion pounds (milk-equivalent, fat-solids basis) last year, up 17.7 percent from 1982. Milk equivalent purchases during January-February 1984 were 3.3 billion pounds, down about 575 million pounds (15 percent) from a year earlier. With lower milk production (marketings) and higher commercial disappearance, removals are expected to decline substantially in calendar 1984. However, even with the lower purchases, USDA uncommitted inventories of dairy products would remain very large.

FOREIGN TRADE AND TRENDS

Imports Larger, Exports Smaller

During 1983, reported imports of dairy products equaled 2.6 billion pounds of milk on a fat-solids basis, up about 6 percent from the previous year. The imports were less than 2 percent of U.S. milk production. Census Bureau data indicate that imports of quota dairy products totaled 2,243 million pounds milk equivalent, slightly more than the calendar year quota of 2,234 million pounds. In addition, a number of items were reported at above-quota levels in both 1982 and 1983. Thus, an error has occurred in the reported Census data since imports of quota dairy products are strictly controlled by USDA and the U.S. Customs Service.

On a product-weight basis, 286.2 million pounds of both quota and nonquota cheese were imported during 1983, more than a 6-percent increase. On a milk-equivalent basis, cheese made up about 87 percent of total imports.

During 1983, exports of U.S. dairy products equaled 2.4 billion pounds, down 38 percent from 1982, but still three times the average amount of exports during the 1970's. The drop was due to the 1981 New Zealand butter sale that resulted in large milk-equivalent exports during 1982.

Foreign Milk Production Expected To Increase

World milk production totaled a little over 407 million metric tons in 1983, up 14 million (3.6 percent) from 1982. Foreign production, at 344 million tons, showed only a slightly larger gain—3.7 percent. Production gains were the largest in the USSR (5.4 million tons) and the European Community (4.1 million tons). Brazil, India, and Poland each had increases of around 500,000 tons. Mexican production dropped because of reduced cow numbers brought on by the 1982 drought. Some South American countries suffered from extremely dry weather and short feed supplies last year.

Foreign milk production is expected to rise around 2 percent this year. Large increases will continue in the USSR unless there is a deterioration in summer pastures and forage and fodder supplies for next winter. Currently, USSR supplies are abundant and the winter has been relatively mild. Based on the assumption of fairly restrictive production quotas or unfavorable milk and dairy product price supports, milk production in the EC is expected to increase only 1.5 to 2 percent. Brazil and India will continue to show healthy increases, but Polish production may slump to 1982 levels. Dry conditions last fall and a return to more normal pasture conditions this summer (last summer was very favorable) are the reasons for the expected decline.

World butter production rose almost 9 percent last year, principally because of large gains in the EC and the Soviet Union. The sharply higher Soviet milk production led to record butter output. EC production rose more than 10 percent as huge milk surpluses went into manufacturing use.

Nonfat dry milk production followed much the same pattern as butter—up 8 percent from 1982. While most of

Table 23.—Dairy products: U.S. imports, quota and nonquota, total 1982-83, and January 1983-84[1]

Product	Calendar year quota	Annual			January		
		1982	1983	1983 as a % of 1982	1983	1984	1984 as a % of 1983
	Thousand pounds			*Percent*	*Thousand pounds*		*Percent*
Cheese, quota types							
American							
-cheddar	12,205.3	12,682	[4]12,746	101	719	659	92
-other	7,545.4	5,163	8,909	173	2,401	1,176	49
Italian							
-original loaves	12,374.4	12,139	12,121	100	646	1,755	272
-other	1,550.0	1,436	1,537	107	82	5	6
Edam and Gouda							
-natural	9,208.6	8,459	8,967	106	754	890	118
-processed	3,151.3	2,955	3,077	104	195	84	43
Blue mold	5,469.6	5,096	5,603	110	471	490	104
Swiss							
-Emmenthaler	70,278.1	67,193	68,441	102	4,629	3,936	85
-Gruyere process	16,479.0	14,848	15,693	106	1,296	728	56
Other							
-over 0.5% fat	89,466.8	87,996	90,417	103	6,867	4,312	63
-under 0.5% fat	12,621.1	12,249	12,145	99	800	415	52
Total	240,349.6	230,216	239,656	104	18,861	14,450	77
Cheese, nonquota types							
Other cow's milk cheeses[2]		14,724	18,399	125	1,255	2,547	203
Miscellaneous[3]		1,201	1,479	123	145	198	137
Pecorino		22,291	25,703	115	4,083	4,791	117
Roquefort		910	1,010	111	36	105	292
Total		39,127	46,591	119	5,518	7,643	138
Total cheese, Quota and nonquota	240,349.6	269,343	286,247	106	24,379	22,092	91
Other quota products							
Butter	707.0	[4]1,746	[4]1,724	99	43	107	249
Butteroil	1,200.0	1,200	1,200	100	1,200	1,200	100
Butterfat mixtures	2,580.0	2,335	2,334	100	13	205	(5)
Ice cream	3,377.3	0	0	0	0	0	0
Frozen cream	12,540.0	[4]15,133	[4]14,179	94	2,047	2,052	100
Nonfat dry milk	1,807.0	[4]1,935	[4]2,399	124	104	147	141
Dried buttermilk and whey	496.0	355	400	113	0	0	0
Evaporated milk	1,312.0	[4]4,036	[4]7,181	178	940	462	49
Condensed milk	4,079.0	3,129	3,763	120	312	595	191
Chocolate crumb							
-regular	21,409.2	18,825	16,240	86	649	1,439	222
-lowfat	4,680.0	740	1,252	169	61	0	(6)
Animal feed with milk solids	16,300.0	15,948	15,060	94	5	305	(5)
Nonquota products							
Casein		176,752	159,527	90	16,748	16,455	98
Lactose		1,050	1,055	100	118	145	123
Milk-equivalent, fat-solids basis, total all products	2,234,270	[4]2,476,760	2,615,583	106	259,825	247,005	95

[1]Preliminary. [2]Primarily soft, ripened cheeses. [3]Gjetost, Bryndza, Gammelost and Noekkelost, and Goya. [4]Probable error in reported data. [5]More than 1,000. [6]Less than 1.

Source: U.S. Department of Commerce, Bureau of the Census.

the gain was in the EC, all the major producers showed small to moderate increases.

World cheese production rose only about 2 percent in 1983. New Zealand, Australia, and the EC had only marginal increases. The only large gains (5 to 7 percent) were in the United States and the USSR.

With the much smaller increases in milk production this year, all products will show little gain. Butter and nonfat dry milk output may advance only 1 to 2 percent. However, this estimate, like that for milk, is based on the assumption of restrictive production measures in the EC. A drop in U.S. cheese production this year will offset the small increase expected in the EC. Thus, world cheese production may only match 1983 levels.

Table 24.—U.S. dairy trade, 1982-83[1]

Year and quarters	Imports		Exports	Shipments[2]
	Cheese	Other		
	Million pounds			
1982				
1st	359	62	1,558	153
2nd	439	126	938	157
3rd	538	43	592	129
4th	792	117	846	163
Year[3]	2,128	349	3,935	602
1983				
1st	512	121	500	152
2nd	493	45	870	158
3rd	532	44	434	130
4th	736	132	623	136
Year[3]	2,273	343	2,427	577

[1]Milk-equivalent, fat-solids basis. [2]To U.S. territories. [3]May not add because of rounding.

Table 25.—Dairy product imports, 1970-83[1]

Year	Yearly quota[2]	Imports subject to quota	Imports not subject to quota	Total
	Million pounds			
1970	946	841	1,033	1,874
1971	973	776	580	1,356
1972	1,166	1,023	671	1,694
1973	3,608	3,263	596	3,859
1974	2,293	1,968	955	2,923
1975	1,306	976	693	1,669
1976	1,306	1,037	906	1,943
1977	1,306	1,119	849	1,968
1978	1,306	1,226	1,084	2,310
1979	1,306	1,235	1,070	2,305
1980	2,231	1,820	289	2,109
1981	2,234	2,061	268	2,329
1982	2,234	2,163	314	2,477
1983	2,234	[3]2,243	373	[3]2,616

[1]Milk-equivalent, fat-solids basis. [2]Includes temporary quotas authorized in 1973 and 1974. [3]Probable error in reported data.

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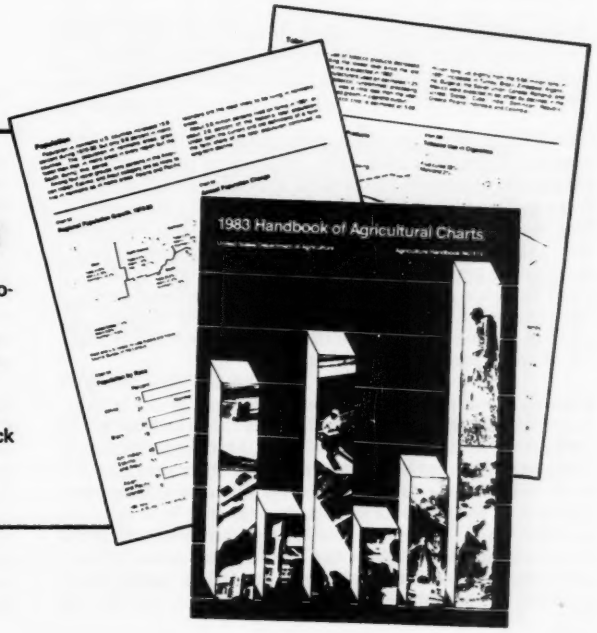

Participation in the Milk Diversion Program

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Abstract: The Dairy and Tobacco Adjustment Act of 1983 resulted in a program to pay dairy farmers not to market milk. Nearly 38,000 producers signed contracts which would result in contracted diversions of 7.5 billion pounds in calendar 1984 5.4 percent of total U.S. milk production in 1983. However, as a group, participating producers had already reduced their marketings below their base. Therefore, the effective reduction in marketings from 1983 to 1984 by participants will be about 3.8 percent of 1983 production.

Keywords: Milk diversion program, participation, marketings, regional differences

The Dairy and Tobacco Adjustment Act of 1983 was a major departure from traditional dairy policy in that it offerred substantial direct Government payments to a producer to reduce marketings from a historical base. This payment program and the rebatable second 50-cent deduction of the preceding legislation represented the first attempts to add voluntary supply-management type provisions to the dairy price support program—after more than 30 years of operating as a program to remove surplus dairy products from the commercial market.

Summary of Signup Data

Almost 38,000 producers signed contracts to reduce their marketings below their base. Participating producers will receive a direct payment of $10 per cwt for the amount of the reduction.

The 1983 marketings of the participants were about 22 percent of the U.S. total. The contracting producers represent 12 percent of the total operations with milk cows and roughly a fifth of commercial dairy farmers. The average size of the participants' operations was similar to that of nonparticipants. In 1983, participants had an average herd size of 57 cows and marketed about 14,000 pounds of milk per cow. While both these measures are well above the overall U.S. averages (which include noncommercial operations), they were fairly typical of commercial dairy producers.

Producers contracted to reduce marketings by 9.4 billion pounds, or 23 percent, during January 1984 to March 1985, from an established base of 41.0 billion pounds. Producers will receive full payment for their actual reductions as long as the reductions fall within 3 percentage points of their contracts and are in the 5- to 30-percent range. No payment will be made for less than 5 or more than 30 percent of the participants' base. Payment could be made on as little as 8.1 billion pounds or as much as 10.3 billion pounds.

Table A.—Distribution of producers, enrolled base, and contract diversions by level of participation

Contract level[1]	Producers	Enrolled base	Diversions[2]
Percent		*Percent of total*	
5-10	11.4	13.0	5.2
11-15	8.5	10.6	6.6
16-20	11.7	12.7	10.8
21-25	6.6	7.0	7.4
26-30	61.8	56.6	70.0
All	100.0	100.0	100.0

[1]Reduction from base specified in contract. [2]Assumes producers exactly meet their contracts.

For calendar 1984, contract diversions totaled 7.5 billion pounds and the established base was 32.8 billion pounds. Diversions equaled 5.4 percent of total U.S. production (5.5 percent of marketings) in 1983, but contract flexibility would generate a range of 4.7 to 5.9 percent. Most of the contracts were for large reductions. About 62 percent of the participants agreed to reduce marketings by 26 to 30 percent. This group represented 57 percent of the enrolled base and 70 percent of the contract diversions. Only 11 percent of the participants signed up for a 5-10 percent diversion. Generally, those contracting for larger diversions had smaller herds and lower output per cow.

Regional differences in participation were pronounced. Contract diversions ranged from 2 percent of 1983 production in Pennsylvania to 15 percent in Florida. Diversions were heaviest in most of the South, the Plains States, the western Corn Belt, and some of the Mountain States. Participation was relatively limited in the Northeast and low in the Lake States and Pacific regions—the major milk producing regions. The diversion rate in the five major dairy States—Wisconsin, California, New York, Minnesota, and Pennsylvania—was 3.8

Diversions as % 1983 Production

Table B.—Actual marketings of participants (July-September 1983), marketings needed to meet contracts, and remaining reductions by level of participation

Contract level[1]	July-Sept. 1983 marketings	Contract marketings[2]	Remaining reductions[2]
Percent		*Percent of base*	
5-10	97.4	90.8	6.6
11-15	95.6	85.9	9.7
16-20	94.9	80.7	14.2
21-25	94.4	75.8	18.6
26-30	90.8	71.7	19.1
All	93.0	77.1	15.9

[1]Reduction from base specified in contract. [2]Assumes producers exactly meet their contracts.

Adjusted Diversions as % 1983 Production

percent of production, little more than half the rate of the other 43 States. The program excludes Alaska and Hawaii.

Most of the participants (83 percent) plan to reduce marketings by culling more cows. They reported that they would cull 891,725 cows by March 31, 1985, 339,232 more than without the program. Many participants plan to reduce feeding (45 percent) and a few intend to milk less frequently (3 percent). Forty percent of the producers will use other methods, which may include delayed breeding of heifers, extended dry periods, early culling, and increased feeding or other farm use of milk. Most farms probably will use a combination of methods.

Implications of the Signup

The actual year-to-year reduction in milk output in 1984 will be less than the 5.4 percent (7.5 billion pounds) noted above. As a group, participants were already reducing marketings before the program started. Adjusted for seasonality, marketings by those producers that signed contracts slipped slowly even during the base period (either 1982 or the average of 1981-82). In 1983, reductions accelerated. Marketings by participants were 5 percent below their base in the first quarter of 1983 and 8 percent lower by the last quarter. For the year, marketings were about 6.8 percent below the base. Therefore, the difference between the contracted level of marketings and the actual 1983 marketings of participants represents 3.8 percent of U.S. production.

Each group of participants had lower marketings during the third quarter of 1983 than in the base period. Not surprisingly, the level of participation was correlated with reductions already made. The group that signed up for a 5-10 percent reduction had 3 percent lower marketings, while the 26-30 percent group had cut back an average of 9 percent. The group participating at 26-30 percent will have the largest adjustment to make but can reach the contract marketings by a reduction of only 21 percent from third-quarter 1983.

In addition, there is no penalty for reductions greater than the maximum amount for which a producer can be paid. Thus, some of those producers who contracted for a reduction close to 30 percent likely took the opportunity of getting paid for going out of business. This accelerated exit from dairying may swell the actual reductions in milk marketings and may be the most effective part of the program. However, the impact probably will be greatest toward the end of the program, when exiting producers can freely dispose of remaining cows and other assets after a fairly short wait.

Regional variation in participation changes somewhat after adjusting contract diversions for reductions already made. Participants in some of the Southern and Mountain States had substantially reduced their marketings by the third quarter of 1983. Thus, the largest year-to-year reductions because of the program probably will come from the following States: Georgia, Florida, Kentucky, Nebraska, Kansas, Missouri, Oklahoma, and Arkansas.

Why the Low Signup?

Participation in the paid diversion program was lower than many expected. The $10 payment rate was roughly one and one-half times the average returns over variable cash costs, seemingly quite attractive. Yet, many milk producers did not sign contracts—including 30 percent of those who bothered to establish their base. In addition, possibly as much as half of the milk from herds that qualified for the payment program because of reductions already accomplished is not covered by contract.

Many producers decided that compliance with a contract would not be profitable, particularly if they had expanded production since the base period. A producer with average costs and returns who had expanded by a modest 5 percent would have to cut current production by more than 14 percent just to break even. Necessary reductions are almost prohibitive for producers who had expanded by 10 percent or more. These producers accounted for a large share of 1983 output.

Other producers decided that the costs of bringing production back up after the end of the program were too high. The costs of replacing slaughtered cows probably were especially important; a good cow sold for beef represents a capital loss of about $500. Some dairy farmers could not reduce cash costs enough. For example, some land used for feed production can not be shifted easily into cash crops. The sale of dairy replacements forms a sizable share of the total operation on some farms. These producers would have had to give up this part of their business to qualify.

Other reasons undoubtedly played some role: Dairy farmers are relatively unaccustomed to direct Government programs. The law allowed them a fairly short time to digest complex regulations and to make a decision. Some were unsure about whether they would qualify because of cows sold after November 8 or because of ownership changes. The potential penalties for not complying with a contract are severe. Some producers felt that the contracts too sharply curtailed their business independence. Others are against participation in Government programs almost regardless of the attractiveness.

On the other hand, participation may well have been higher if the time for implementation and education had been longer or if there had been more experience with this type of program.

Results of the Diversion Program

It is too early to judge the success of this initial voluntary supply management program. A fifth of the commercial producers did participate and the indicated 1983 to 1984 drop in milk marketings representing nearly 4 percent of U.S. marketings will reduce the milk surplus. However, the overall impact on total U.S. production will depend on actions taken in coming months by nonparticipating producers, who represent about 80 percent of all commercial milk producers in the country.

It appears unlikely that this type of voluntary incentive program can eliminate a surplus the size of the current one. However, the paid diversion programs may assist in partially reducing a large surplus.

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Table C.—Milk diversion program: Signup summary

State	Operations with milk cows	Unit enrolled	Base enrolled[1]	Total diverted[1]	Percent of enrolled base diverted[1]	Planned slaughter due to:	
						Normal culling[2]	Diversion program[2]
	Number		*Cwt*		*Percent*	*Number*	
Alabama	2,500	172	2,408,745	630,703	26.18	3,741	2,433
Arizona	800	43	3,504,250	844,634	24.10	6,941	3,921
Arkansas	5,000	459	3,546,419	969,597	27.34	4,049	3,499
California	5,500	651	36,737,344	7,133,515	19.42	69,237	24,559
Colorado	3,800	207	3,303,394	836,235	25.31	7,232	3,812
Connecticut	1,000	116	1,552,146	294,241	18.96	2,734	1,572
Delaware	250	21	196,343	42,102	21.44	244	261
Florida	1,700	185	12,651,163	3,172,814	25.08	34,212	11,779
Georgia	2,700	363	5,847,865	1,500,529	25.66	8,922	5,207
Idaho	4,500	579	6,297,315	1,641,739	26.07	10,010	6,275
Illinois	6,100	1,171	8,468,790	1,794,628	21.19	14,579	11,001
Indiana	8,100	862	5,695,328	1,290,749	22.66	8,781	7,404
Iowa	12,000	2,649	13,635,099	3,202,053	23.48	23,826	18,048
Kansas	5,000	942	6,653,619	1,580,813	23.76	12,397	8,698
Kentucky	9,500	1,783	9,463,401	2,501,871	26.44	12,495	10,948
Louisiana	3,700	307	3,466,306	859,408	24.79	4,793	2,557
Maine	1,900	110	905,804	218,538	24.13	1,616	991
Maryland	2,300	199	2,167,637	424,848	19.60	3,831	1,868
Massachusetts	1,100	144	1,396,226	306,571	21.96	2,569	1,564
Michigan	9,000	1,282	10,332,608	2,256,774	21.84	17,636	11,936
Minnesota	25,000	5,421	27,463,957	6,247,421	22.75	46,844	33,796
Mississippi	2,800	354	3,260,687	876,310	26.88	4,778	2,902
Missouri	11,500	1,813	12,252,398	3,118,372	25.45	18,503	14,862
Montana	3,300	50	641,328	137,422	21.43	1,100	916
Nebraska	5,000	1,031	5,705,328	1,400,735	24.55	9,649	6,988
Nevada	400	7	639,230	144,258	22.57	1,375	742
New Hampshire	800	60	606,048	140,913	23.25	1,076	770
New Jersey	900	63	821,318	163,407	19.90	1,434	451
New Mexico	1,600	36	1,298,105	348,556	26.85	2,353	1,182
New York	18,000	1,490	13,361,976	2,936,615	21.98	22,521	11,397
North Carolina	6,000	225	3,049,549	673,302	22.08	4,469	3,460
North Dokota	4,900	594	2,767,997	706,702	25.53	3,785	2,739
Ohio	11,700	1,353	9,836,611	2,138,161	21.74	15,701	11,703
Oklahoma	6,000	523	4,687,821	1,204,966	25.70	7,279	4,967
Oregon	4,800	178	2,894,050	641,635	22.17	5,227	2,795
Pennsylvania	21,000	1,227	9,713,418	2,032,203	20.92	15,637	9,461
Rhode Island	130	5	40,049	10,354	25.85	8	17
South Carolina	2,200	85	1,492,995	329,524	22.07	2,393	1,363
South Dokota	6,400	1,196	5,987,607	1,520,453	25.39	10,755	7,356
Tennessee	8,500	897	7,510,609	1,968,988	26.22	10,457	6,652
Texas	10,000	854	14,452,930	3,800,935	26.30	19,492	12,243
Utah	2,800	288	3,870,952	867,272	22.40	6,699	3,773
Vermont	3,800	458	4,267,925	900,444	21.10	7,631	3,709
Virginia	8,000	423	4,766,736	1,011,517	21.22	7,670	4,606
Washington	3,600	237	5,430,850	1,285,690	23.67	8,463	5,522
West Virginia	3,800	120	936,775	203,950	21.77	1,492	890
Wisconsin	44,000	6,597	41,529,573	8,561,044	20.61	65,064	45,002
Wyoming	1,200	58	478,377	115,949	24.24	793	635
Total	303,580	37,888	327,994,956	74,989,460	22.86	552,493	339,232

[1]Annual basis. [2]15-month base.

Profitability of Milk Production in Selected States

Boyd M. Buxton, Tom McGuckin, Roger Selley and Gayle Willett[1]

Abstract: This article estimates the relative rate of return to investment in milk production in four States: Minnesota, New Mexico, Arizona, and Washington. Results show the regional shifts in milk production could continue as returns are favorable in those areas showing the greatest expansion during the 1970's.

Keywords: Rate of return, investments, milk production, budgets, costs.

The dairy industry has undergone many structural changes over the years. At the farm level, dairy operations have become fewer and larger, and U.S. milk production has shifted regionally. From 1971 to 1981, milk output expanded in the Southwest, the Northwest, the Lake States, and along the East Coast, but declined in both the Western Plains and the Central Region. Whether the regional shifts continue will depend in part on the relative profitability of dairying in the various regions.

This article estimates the relative rates of return that could be expected from setting up a new dairy operation that was judged to be typical in Minnesota, New Mexico, Arizona, and Washington. Budgets were developed for seven operations in the four States (table I).

Specific assumptions were made for each dairy operation considered. In Arizona and New Mexico, cows are assumed to be housed in open corrals with sun shades while free-stall housing is assumed on the 125-cow Minnesota dairy and the 140-cow Washington dairy. A stanchion barn with an around-the-barn pipeline milking system is assumed for the 52-cow Minnesota dairy. Milking parlors are assumed for all other dairies.

Both Minnesota dairies are budgeted for sufficient land to produce all hay, haylage, corn silage, and corn grain fed to the animals. It is assumed that the Washington dairy produces silage only and purchases other feeds. The Arizona and New Mexico dairies purchase all feeds and therefore require no field equipment.

Building, equipment, machinery, and land costs approximate those that existed in 1981 as do all operating costs.

A simple average annual rate of return to total investment is used to measure profitability and compare returns. It is expressed as:

$$\text{Rate of return} = \frac{\text{revenue} - \text{operating costs} - \text{ownership costs}}{\text{total investment}}$$

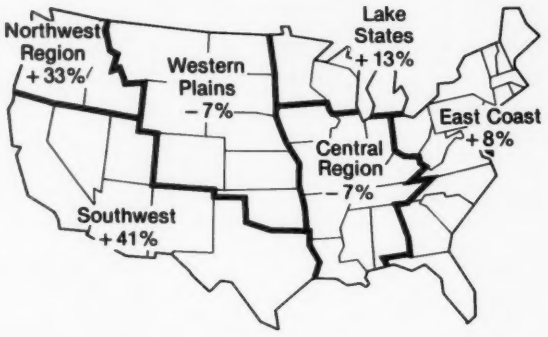
A discussion of each term in the equation follows.

Revenue: The operations receive all revenue from the dairy enterprise. Milk sales are the single largest source of revenue but the sale of cull cows, bull calves, and replacement heifers in excess of those needed for herd replacement is also important. Price changes for any of these items would have an impact on the dairy operation's total revenue and, therefore, on the rate of return to total investment.

Revenue from milk sales depends on the amount of milk produced and the price received for it. It is assumed that herds with good management could achieve the same level of milk production per cow as the average achieved by herds on Dairy Herd Improvement Association tests in the respective States: 14,840 pounds in Minnesota; 16,284 in Arizona; 16,135 in New Mexico; and 16,233 in Washington. In 1981, dairy producers received $13.11 per cwt for milk in Minnesota, $14.18 in Arizona, $14.32 in New Mexico, and $13.58 in Washington.

Operating costs: These include purchased feed and a wide range of expenses such as farm repairs, hired and opera-

How the Dairying Picture is Changing



Percent change in milk production in various regions from 1970-71 to 1980-81.

USDA

[1]Agricultural Economist, National Economics Diversion, Economic Research Service, USDA; Farm Management Specialist, New Mexico State University; Extension Economist, University of Arizona; and Extension Economist, Washington State University, respectively.

Table I.—Dairy operations for which budgets were prepared

Minnesota	
52-cow	Stanchion
125-cow	Free stall
Arizona	
349-cow	Drylot
834-cow	Drylot
1,436-cowDrylot	
New Mexico	
900-cow	Drylot
Washington	
140-cow	Free stall

tor labor, utilities and fuel, veterinary services, breeding fees, and other costs. Operating costs also include all seed, fertilizer, fuel, and other annual expenses associated with feed production on Minnesota and Washington dairies.

Feed costs: Feed, whether purchased or raised, is the single most important cost in milk production. The basic assumption, regardless of location, was that a milk cow of a given weight and breed producing the same amount of milk would require the same amount of dry matter. Regional variations in forage quality would be made up through changing the composition of the concentrates by adding supplements so as to yield a balanced ration. However, as the ration composition differs from one State to another, it can make a difference in the relative rate of return to investment.

Labor cost: The labor cost for each dairy is the total required for the entire operation, including raising crops for feed in Minnesota and Washington. The total hired labor ranges from 1.03 of a man equivalent (2,575 hours) of part-time hourly labor on the 52-cow Minnesota dairy to 15 full-time employees on the 1,436-cow Arizona dairy. Some of the part-time labor hired in Minnesota and Washington is seasonal and associated with crop production. The wages of hired labor include fringe benefits. In addition to the wages, part of the housing costs are provided for workers in the New Mexico budget. The annual charge for the operator's labor ranged from $20,000 in Minnesota to $40,000 for the 1,436-cow Arizona dairy.

Annual ownership costs: These include depreciation, property taxes, and insurance premiums. Straight line depreciation was calculated on durable assets including buildings, dairy equipment, tractors and vehicles, and field equipment. Depreciation was based on the estimated useful life of the item. Property taxes and insurance premiums were based on annual dollars paid per $100 of average annual value.

All interest charges, except those on operating costs, were excluded to calculate the average annual rate of return to total investment. The model assumes a money withdrawal for the operator's labor is already reflected in the calculation of the rate of return to investment.

Total investment: Investment ranged from $726,000 for a 52-cow Minnesota dairy to $6,826,000 for the 1,436-cow Arizona dairy (table II). When livestock and land costs are included, approximately $14,000 per cow is required for the 52-cow Minnesota dairy. Excluding land, investment per cow is still over $8,000. This compares with $3,212 for the 900-cow New Mexico dairy.

An acre of land well beyond the urban development in Arizona could be acquired for about $2,000 including the cost of excavating and grading the land for trench silos and waste ponds. An acre of land near Las Cruces, N.M., could be acquired for about $4,000 including excavation cost. Land in Northwest Washington would cost about $4,000 per acre. These assumed values were based on the same studies on which investment costs were obtained. In rural Minnesota, the land base for a typical dairy could have been acquired for $1,526 per acre in 1980.

Investment in field machinery, tractors, and vehicles is approximately $2,500 per cow on the 52-cow Minnesota dairy, compared with $190 in New Mexico. When only dairy buildings and equipment are considered, investment per cow is still almost four times higher for the 52-cow Minnesota dairy ($3,874) than for the New Mexico dairy ($988).

Investments per cow are very similar in Arizona and New Mexico. The major difference is the $1,218 invested in milk base in Arizona. There is no quota or production base program in New Mexico.

In Minnesota, the investment per cow is about $2,590 less for the 125-cow dairy using free-stall housing and a milking parlor than for the 52-cow stanchion-barn dairy. This difference is partly due to more efficient use of field machinery and tractors in dairy feed production. In Arizona, investment per cow is also less for larger herds than for smaller herds (table II). However, investment per cow declines only slightly, from about $4,924 for the 359-cow Arizona dairy to $4,436 for the 1,436-cow Arizona dairy.

Rate of return on investment: The rate of return was an estimated 0.5 percent for the 52-cow Minnesota dairy and 4.7 percent for the 125-cow Minnesota dairy compared with 15.2 percent for the 900-cow New Mexico dairy. The estimated rate of return was higher in both Arizona and New Mexico than in either Minnesota or Washington. In Arizona, the rate of return ranged from 8.5 percent on the 350-cow dairy to 11.5 percent on the 1,436-cow dairy (table III).

These results show the marked advantage in terms of investment per cow that large scale dairies in New Mexico and Arizona have compared with smaller Minnesota dairies, whether speaking of total investment or just dairy buildings and equipment.

Longer-Term Outlook

The average annual rates of return based on budgeted 1981 revenues and costs provide a comparison of profitability between States. Adjustments were made where the 1981 conditions were believed to deviate from the longer-term interregional prices and costs.

Water cost: The cost of irrigation water in the Southwest may increase many times as population continues to put pressure on the available supply. If the price of irrigation water tripled, alfalfa hay prices would increase an estimated $12 to $15 per ton. This would reduce returns

Table II.—Investment requirements for assumed dairy operations, 1981

Investment item	Herd size						
	Minnesota		Arizona			New Mexico	Washington
	52-cow dairy	125-cow dairy	359-cow dairy	834-cow dairy	1,436-cow dairy	900-cow dairy	140-cow dairy
	Thousand dollars						
For total dairy operation	726	1,421	1,767	3,992	6,826	3,125	868
	Dollar per cow						
Dairy buildings and equip.	3,874	2,471	1,354	1,227	1,215	988	1,689
Tractors and vehicles	1,043	693	220	0	200	190	433
Field mach.	1,433	633	0	0	0	0	269
Cattle	2,000	2,000	2,022	2,019	2,014	2,033	2,000
Land	5,605	5,567	110	109	107	261	1,714
Milk base	0	0	1,218	1,218	1,218	0	88
Total	13,955	11,364	4,924	4,703	4,754	3,472	6,203

Table III.—Estimated rate of return under alternative assumptions

Investment item	Herd size						
	Minnesota		Arizona			New Mexico	Washington
	52-cow dairy	125-cow dairy	359-cow dairy	834-cow dairy	1,436-cow dairy	900-cow dairy	140-cow dairy
	Percent rate of return on investment						
1981 base	0.5	4.7	8.5	11.0	11.5	15.2	4.7
Triple water cost for alfalfa	0.5	4.7	7.1	9.6	10.0	12.5	4.6
Longer-term breakeven cost for alfalfa	0.5	4.7	9.6	12.3	12.7	15.6	4.0
Lower Class I utilization	0.5	4.7	6.3	8.7	9.2	11.4	4.1

in New Mexico from 15.2 to 12.5 percent and, on the large Arizona dairy, from 11.5 to 10.4 percent.

Alfalfa cost: Compared with the 1981 prices, the longer-term breakeven production cost per ton for hay was estimated to be about $10 lower in Arizona, $2 lower in New Mexico, but $6 higher in Washington. Using the expected long-run relative prices increased the calculated annual rate of return from 15.2 to 15.6 percent for the 900-cow New Mexico dairy and 11 to 12.3 percent for the 834-cow Arizona dairy (table 3). The expected rate of return would decrease from 4.7 to 4 percent for the 140-cow Washington dairy. These results increase the profitability of dairies in the Southwest relative to Minnesota.

Lower Class I utilization: The proportion of milk utilized as fluid may not change the milk price received by farmers uniformly in all States. If milk production during the 1980's expands at half the rate of the 1970's, and fluid use remains about the same, the relative prices received by dairy producers would be about the same in Minnesota, 67 cents per cwt less in Arizona, 83 cents less in New Mexico, and 30 cents less in Washington. Recalculating the rate of return based on these lower prices indicates a likely narrowing of the differences between the States. The rate of return would decline from 11 to 8.7 percent on the 836-cow Arizona dairy and 15.2 to 11.4 percent in New Mexico (table III).

Land cost: Population and urban growth can create wide variations in land values, especially for dairies located close to metropolitan areas. Possible capital gains were not considered. The total acreage of the Arizona and New Mexico dairies is less than for Minnesota but the opportunity for capital gains through appreciation in land values may be greater in Arizona and New Mexico. Individuals would be expected to be willing to accept a lower rate of return to investment in milk production where there is more potential for appreciation of land values.

Regional shifts in milk production could continue as returns are quite favorable in those areas showing the greatest expansion during the 1970's. We are in a period of adjustment when resources must be taken out of the dairy sector to solve the surplus problem. New investment will likely be limited during this period, but afterwards the relative profitability will remain a factor in the location of milk production.

The rates of return on alternative investment opportunities have not been examined in this report. A decision to invest in milk production, in large part, depends on the possible rate of return to money invested in nondairy alternatives.

Differences in milk production per cow account for some of the differences in rate of returns between regions. There are no regional differences that explain why average milk production per cow is lower in Minnesota than in New Mexico, Arizona, or Washington. However, dairy producers in Minnesota tend to be spread much thinner in their management responsibilities. Rather than focusing attention exclusively on the dairy herd, Minnesota producers also produce feed crops. Also, labor in the large-scale dairies in New Mexico and Arizona is more specialized, allowing closer management of individual dairy tasks.

The rate of return to investment in New Mexico and Arizona is quite sensitive to changes in the cost of irrigation water for alfalfa. Nonfarm competition for water could alter the expected returns by increasing forage costs. Part of this question involves whether agriculture carries the full costs of irrigation water or receives water subsidies. The uncertainty of how water costs might change increases the risk associated with milk production in areas depending on irrigation.

Climate differences probably account for the differences in herd size and technologies employed in North Central States compared with the Southwest States. The fact that large-scale drylot dairying, so typical in the Southwest and South, is practically nonexistent in the North Central area suggests limits to interregional transfer of technologies and practices. Housing requirements during the cold winter months are different in Minnesota than in the warmer regions. Higher rainfall in Minnesota than in New Mexico and Arizona greatly changes waste handling problems.

Forage quality is more of a problem and the forage market is less developed in the high rainfall areas than in the Southwest. The trends to high-moisture feeds such as haylage, corn silage, and high-moisture-corn in the high rainfall climates make it more difficult for feed markets, especially for forages, to develop than in the areas where dry feeds are fed. Dry feeds can be stored and transported over longer distances. For these reasons, existing differences in herd size, practices, and technologies between regions will likely remain.

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